

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION
(PCT Rule 61.2)

Date of mailing (day/month/year) 11 April 2001 (11.04.01)	To: Commissioner US Department of Commerce United States Patent and Trademark Office, PCT 2011 South Clark Place Room CP2/5C24 Arlington, VA 22202 ETATS-UNIS D'AMERIQUE in its capacity as elected Office
International application No. PCT/BE00/00086	Applicant's or agent's file reference P.SIRI.04/WO
International filing date (day/month/year) 19 July 2000 (19.07.00)	Priority date (day/month/year) 23 July 1999 (23.07.99)
Applicant LUGIL, Nico et al	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

20 February 2001 (20.02.01)

in a notice effecting later election filed with the International Bureau on:

2. The election was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Pascal Piriou Telephone No.: (41-22) 338.83.38
---	---

PATENT COOPERATION TREATY

PCT

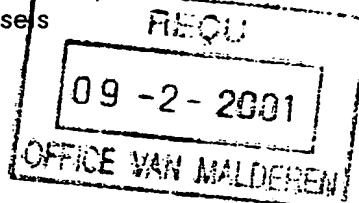
NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

VAN MALDEREN, Joëlle
 Office Van Malderen
 Place Reine Fabiola, 6/1
 B-1083 Brussels
 BELGIQUE



Date of mailing (day/month/year) 01 February 2001 (01.02.01)			
Applicant's or agent's file reference P.SIRI.04/WO		IMPORTANT NOTICE	
International application No. PCT/BE00/00086	International filing date (day/month/year) 19 July 2000 (19.07.00)	Priority date (day/month/year) 23 July 1999 (23.07.99)	
Applicant SIRIUS COMMUNICATIONS N.V. et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
 AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
 AE,AG,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,ES,
 FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,
 MN,MW,MX,MZ,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,
 The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
 01 February 2001 (01.02.01) under No. WO 01/08314

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P.SIRI.04/WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/BE00/00086	International filing date (day/month/year) 19/07/2000	Priority date (day/month/year) 23/07/1999
International Patent Classification (IPC) or national classification and IPC H04B1/707		
Applicant SIRIUS COMMUNICATIONS N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 8 sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 20/02/2001	Date of completion of this report 23.11.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ciccarese, C Telephone No. +49 89 2399 7302



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/BE00/00086

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
Description, pages:

1-39 as originally filed

Claims, No.:

1-39 with telefax of 22/10/2001

Drawings, sheets:

1/26-26/26 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/BE00/00086

the drawings, sheets:

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

the entire international application.
 claims Nos. 2-3, 23-30.

because:

the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

no international search report has been established for the said claims Nos. 2-3, 23-30.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

the written form has not been furnished or does not comply with the standard.
 the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1, 4-22, 31-39

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/BE00/00086

	No:	Claims
Inventive step (IS)	Yes:	Claims 1, 4-22, 31-39
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1, 4-22, 31-39
	No:	Claims

**2. Citations and explanations
see separate sheet**

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BE00/00086

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The following documents are referred to; the numbering will be adhered to in the rest of the procedure.

D1: EP 0 767 544 A

D3: EP 0 928 084 A

2. Claim 1 is based on claim 1 of the application as filed. The fact that the phase unbalance precompensation circuit is comprised in the transmitter is based on the fact that, in the original disclosure, page 20, this circuit is comprised in the transmitter specifications.
3. The application belongs to the field of digital radiocommunications.

4. Closest prior art is the document D1.

Claim1 is regarded as novel and inventive (Article 33 (2)-(3) PCT) for the following reasoning:

neither D1 nor D2 disclose a digital circuit for phase unbalance precompensation comprised *in the transmitter*.

The use of such a circuit in the transmitters defined in D1 and D3 would not be obvious for the skilled person.

5. The dependent claims 4-22, 31-39 concern advantageous embodiments of the subject matter of the independent claims and thus their subject matter is also considered to be novel and inventive.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BE00/00086

Re Item VII

Certain defects in the international application

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D3 is not mentioned in the description, nor are these documents identified therein.

1 531 Rec'd I/PT 22 JAN 2002

© Office Van Malderen

Bxl - 18 October 2001

P.SIRI.04/WO

CLAIMS

1. A communication device for W-CDMA signal transmission and reception, which is software configurable, comprising:

10 -a W-CDMA transmitter comprising RAM and/or registers;
-a W-CDMA receiver comprising RAM and/or registers; and
-signal acquisition means,
characterised in that it further comprises a digital circuit for phase unbalance precompensation comprised in
15 said transmitter, said circuit comprising:
- an input register holding the compensation angle,
- means for performing arithmetic to acquire a change of the I,Q angle by the compensation angle.

2. A communication device such as in claim 1,
20 further comprising a circuit for noise and interference estimation, said circuit comprising :
- means to acquire a programmable number of absolute value accumulations at chip rate or oversampled chip rate,
-a programmable low pass filter to average the noise and
25 interference estimations.

3. A communication device such as in claim 1, further comprising a circuit for initial synchronization, said circuit comprising :
-a Matched Filter, energy calculation and accumulating RAM
30 for slot synchronization,
-a set of correlators for frame synchronization & code group identification,
-an energy estimation block,
-Maximum detection means, readable by the microprocessor
35 subsystem.

4. A communication device such as in claim 1, further comprising circuitry to generate packet data transmission, said circuitry comprising :

- A data and activity bits holding buffer,
- I,Q spreaders and gain control means,
- scrambling code generator and scrambling means,
- means for packet timing through RX frame edge triggering.

10 5. The use of a communication device such as in claim 4, for RACH transmission in UMTS/FDD.

6. A communication device such as any one of claims 1 to 4, further comprising a processor.

15 7. A communication device such as in claim 6, characterised in that the processor is arranged to reconfigure the communication device.

8. A communication device such as in claim 6 or 7, wherein the processor controls the RAM and/or registers of said W-CDMA signal transmitter and receiver.

20 9. A communication device such as in any of the claims 6 to 8, characterised in that the transmitter comprises a first programmable pulse shaping filter and that the receiver comprises a second programmable pulse shaping filter.

25 10. A communication device such as in claim 9, characterised in that the pulse shaping filters are programmable to perform GMSK filtering and said transmitter and receiver are arranged to interface with a GSM front-end.

30 11. A communication device such as in claim 10, characterised in that the processor performs the GSM protocol stack.

12. A communication device such as in any of the claims 1 to 11, arranged for waveform transmission and/or reception and/or acquisition of signals selected from the group consisting of UMTS, Satellite UMTS, Galileo, 5 GPS, IS-2000, IMT-2000, CDMA2000, IS-95, 3GPP, 3GPP2 and ARIB signals.

13. The communication device such as in any of the claims 1 to 12, wherein said transmitter comprises one or more elements selected from the group consisting of:
10 -synchronisation hardware to slave transmit start epochs to events external to the transmitter;
-a burst generator for realising discontinuous transmissions;
-a QPN channel containing one or more spreaders with their own amplification of the output;
15 -a combiner to accumulate the QPN channel output;
-a PN code generator;
-a scrambling code generator;
-a scrambler;
20 -a combiner which accumulates the scrambling code output;
-a pulse shaping oversampling filter; and
-an NCO and upconverter for carrier precompensation.

14. A communication device such as in claim 13 wherein the PN code generator is realized as a RAM in 25 which the PN codes are downloaded under control of the processor.

15. A communication device such as in claim 13 or 14, wherein the scrambling code generator is realized as a programmable Gold Code generator.

30 16. A communication device such as in any of the claims 13 to 15, wherein the QPN channel is arranged to execute UMTS forward or return link transmission.

17. A communication device such as in any of the claims 13 to 16, wherein the amplification of the spreader output is arranged to perform transmit power control.

5 18. A communication device such as in any of the claims 1 to 17, wherein the transmitter comprises a time interpolator to perform sub-chip time alignments.

10 19. A communication device such as in any of the claims 1 to 18, wherein the transmitter is arranged for multi-code transmission.

20. A communication device such as in any of the claims 1 to 19, wherein the receiver comprises:

- A pulse shaping filter;
- An optional level control block;

15 -A demodulator assigned to track the multi-path components received from one base station; and

-A reference demodulator for S/(N+I) measurements.

20 21. A communication device such as in claim 20, wherein said receiver further comprises a downconverter prior to said pulse shaping filter, in order to interface at a front-end at an intermediate frequency.

25 22. A communication device such as in claim 20 or 21, wherein the receiver is arranged for execution of UMTS, Satellite UMTS, Galileo, GPS, IS-2000, IMT-2000, CDMA2000, IS-95, 3GPP, 3GPP2 and/or ARIB forward link and return link waveforms.

23. A communication device such as in any of the claims 20 to 22 wherein the level control block comprises:

30 -a programmable shifter to perform coarse grain dynamic control;

-a programmable multiplier to perform fine grain dynamic control;

- an overflow counter operating on the most significant and the second most significant bit;
- an overflow counter operating on the second most and the third most significant bit;

5 -saturation logic to clip the result from the multiplier;

24. A communication device such as in any of the claims 20 to 23, wherein the level control block is operated in a runtime control loop by the processor.

25. A communication device such as in any of the claims 20 to 24, wherein the demodulator comprises:

- a Rake filter, producing a signal at chip rate which is a coherent accumulation of channel corrected multipath components resulting from one base station;
- a tracking unit, using said signal at chip rate for descrambling and despreading a plurality of waveform channels; in which said Rake filter comprises:
- a FIFO to buffer samples at chip rate, coming from said level control block of Claim 20;
- a delay line containing a plurality of registers, the input of the delay line being connected to the output of said FIFO;
- a plurality of finger blocks, the inputs of said finger blocks being connected to programmable tap positions on said delay line; and

25 -a summator of complex outputs of said finger blocks at chip rate.

26. A communication device such as in claim 25, wherein the finger blocks are respectively grouped in a late multipath group and an early multipath group, the Rake filter being arranged to accumulate the energies of the outputs of said late multipath group and said early multipath group, and to use these accumulated values to

feed the time error detector of the DLL used for time tracking.

27. A communication device such as in claim 25 or 26, wherein the Rake filter comprises memories to hold one or more of the following:

- spreading code for a channel correction Pilot;
- scrambling code for a channel correction Pilot;
- a channel correction Pilot symbol modulation;
- a channel correction Pilot symbol activities.

10 28. A communication device such as in claim 27, wherein the memories are controlled by the processor.

29. A communication device such as in claim 27 or 28, wherein the finger block comprises:

- a channel correction Pilot descrambler;
- a channel correction Pilot despreader;
- a channel correction Pilot filter, first performing a coherent channel correction Pilot symbol accumulation over a programmable number of steps, and secondly producing a weighted average on a programmable number of said coherent channel correction Pilot symbol accumulation over a programmable number of steps.
- a channel estimator, generating a channel estimation at chip rate, using the outputs of said Pilot filter;
- a channel corrector, performing a multiplication of the incoming chip stream with the complex conjugate of said channel estimation;
- a calculation of the slot energy;
- a comparison of the slot energy with a programmable threshold;
- 30 -a circuit to force said channel estimation to zero if said threshold is not exceeded.

30. A communication device such as in claim 29, wherein the finger is arranged for slow and fast fading

compensation, by programming the channel correction Pilot filter for slow fading, said channel correction Pilot filter first performing a coherent accumulation over a slot, and secondly performing a weighted average over previous-previous, previous, actual and next obtained slot values, yielding a channel estimation per slot, which is applied by said channel corrector; and for fast fading, said channel correction Pilot filter first performing a coherent accumulation over a slot, and then deriving channel estimations through interpolating consecutive said coherent accumulations over a slot, yielding channel estimations with sub-symbol timing, which are applied by said channel corrector.

31. A communication device such as in any of the claims 20 to 30, wherein the reference demodulator comprises:

- an accumulator of programmable length of the absolute values of samples at chip rate; and
- a low pass filter operating on said accumulator output.

32. A communication device such as in any of the claims 20 to 31, wherein the reference demodulator is arranged to operate in a runtime control loop by the processor.

33. A communication device such as in any of the claims 20 to 32, wherein the demodulator is arranged to perform satellite diversity.

34. A communication device such as in any of the claims 1 to 33, arranged to perform accurate ranging measurements to geostationary satellites.

30 35. An Integrated Circuit comprising the communication device of any of the claims 1 to 34.

36. An Intellectual Property core comprising the communication device of any of the claims 1 to 34.

37. A method for operating a W-CDMA communication device such as in any of the claims 1 to 36, characterised in that it comprises the following steps:
5 -configuring said device for a specific use, and
-transmitting and/or receiving and/or acquiring waveform signals.

38. Method as in claim 37, characterised in that said waveform signals are selected from the group consisting of UMTS, Satellite UMTS, Galileo, GPS, IS-2000, 10 IMT-2000, CDMA2000, IS-95, 3GPP, 3GPP2 and ARIB signals.

39. Method as in claim 37 or 38, characterised in that said configuring is done by a processor.

PATENT COOPERATION TREATY
PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P.SIRI.04/WO	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/B E 00/ 00086	International filing date (day/month/year) 19/07/2000	(Earliest) Priority Date (day/month/year) 23/07/1999
Applicant SIRIUS COMMUNICATIONS N.V. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :
 - contained in the international application in written form.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority in written form.
 - furnished subsequently to this Authority in computer readable form.
 - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
- 2. Certain claims were found unsearchable (See Box I).
- 3. Unity of invention is lacking (see Box II).
- 4. With regard to the title,
 - the text is approved as submitted by the applicant.
 - the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/BE 00/00086**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1, 4-22, 31-39

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1,4-22,31-39

2. Claim : 2

3. Claim : 3

4. Claims: 20-24

5. Claims: 20+25-30

INTERNATIONAL SEARCH REPORT

International Application No

PCT/BE 00/00086

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B1/707 H04B1/38 H04B7/005 H04B7/26 H04L27/18
H04J13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, INSPEC, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 767 544 A (IMEC INTER UNI MICRO ELECTR ;SAIT (BE)) 9 April 1997 (1997-04-09) cited in the application page 3, line 41 - line 45 page 4, line 35 -page 6, line 23 page 10, line 41 -page 15, line 55 page 30, line 53 -page 31, line 10 ---	1, 4, 6-9, 12-15, 18-22, 31-39
A	US 5 742 637 A (KANTERAKIS EMMANUEL ET AL) 21 April 1998 (1998-04-21) column 3, line 18 - line 34 column 6, line 48 -column 7, line 20 --- -/-	1



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

3 November 2000

Date of mailing of the international search report

02.03.2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

GERLING J.C.J.

INTERNATIONAL SEARCH REPORT

International Application No

BE 00/00086

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>"Sirius Announces World's First Software Configurable W-CDMA Core for Third-Generation Wireless handsets and Base Stations"</p> <p>SIRIUS COMMUNICATIONS PRESS RELEASES, 'Online! 14 June 1999 (1999-06-14), pages 1-2, XP002151828 BRUSSELS (BE)</p> <p>Retrieved from the Internet: <URL:HTTP://WWW.SIRIUSCOMM.COM/PRESSREALEA SES/PRESSCDMAX.HTM> 'retrieved on 2000-10-25! the whole document</p> <p>-----</p>	1,4-22, 34-39
A	<p>EP 0 928 084 A (MITSUBISHI ELECTRIC CORP) 7 July 1999 (1999-07-07)</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/BE 00/00086

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0767544	A	09-04-1997	US	5872810 A	16-02-1999
			EP	0772140 A	07-05-1997
			EP	1065611 A	03-01-2001
			US	5870588 A	09-02-1999
US 5742637	A	21-04-1998	US	6021157 A	01-02-2000
EP 0928084	A	07-07-1999	EP	1071235 A	24-01-2001
			EP	1071236 A	24-01-2001
			EP	1071237 A	24-01-2001
			EP	1071238 A	24-01-2001
			JP	11284688 A	15-10-1999
			JP	2001007883 A	12-01-2001
			JP	2001007888 A	12-01-2001
			JP	2001007881 A	12-01-2001

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number
WO 01/08314 A2

(51) International Patent Classification⁷: **H04B**

(21) International Application Number: **PCT/BE00/00086**

(22) International Filing Date: 19 July 2000 (19.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/145,426 23 July 1999 (23.07.1999) US

(71) Applicant (for all designated States except US): **SIRIUS COMMUNICATIONS N.V. [BE/BE]**; Winge park 51, B-3110 Rotselaar (BE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LUGIL, Nico [BE/BE]**; Vrouwenparklaan 31, B-3110 Rotselaar (BE). **BORGHS, Eric [BE/BE]**; Kollegestraat 75, B-2440 Geel (BE). **LOUVEAUX, Sébastien [BE/BE]**; Avenue De L'Equerre 25 B302, B-1348 Louvain-La-Neuve (BE). **MERTENS, Carl [BE/BE]**; Het Venneke 2, B-2930 Brasschaat (BE). **PHILIPS, Lieven [BE/BE]**; Kleine Kruisweg 9A, B-3201 Aarschot (BE). **VANDERMOT, Jurgen [BE/BE]**; Diestsestraat 250 B3, B-3000 Leuven (BE). **VANHOOF, Jan [BE/BE]**; Wijgmaalbroeck 59, B-3018 Wijgmaal (BE).

(74) Agents: **VAN MALDEREN, Joëlle et al.**; Office Van Malderen, Place Reine Fabiola, 6/1, B-1083 Brussels (BE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

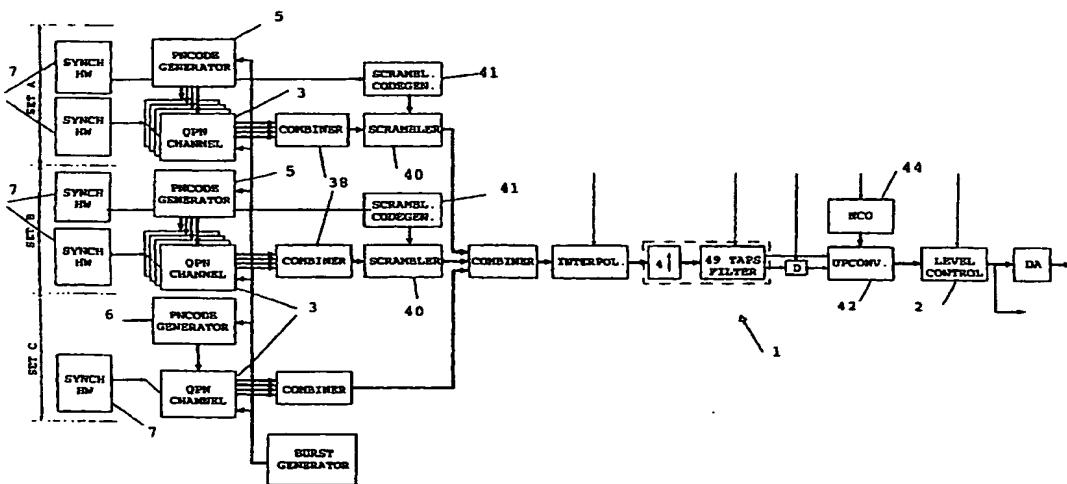
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— Without international search report and to be republished upon receipt of that report.

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR HIGH-SPEED SOFTWARE RECONFIGURABLE CODE DIVISION MULTIPLE ACCESS COMMUNICATION



(57) Abstract: The present invention is related to a communication device for W-CDMA signal transmission and reception, comprising: a W-CDMA transmitter comprising RAM and/or registers, a W-CDMA receiver comprising RAM and/or registers and signal acquisition means, being software reconfigurable, characterized in that it further comprises at least a digital circuit for phase unbalance precompensation. The present invention further relates to a method for operating a W-CDMA communication device of the present invention, characterised in that it comprises the following steps: configuring said device for a specific use, and transmitting and/or receiving and/or acquiring waveform signals.

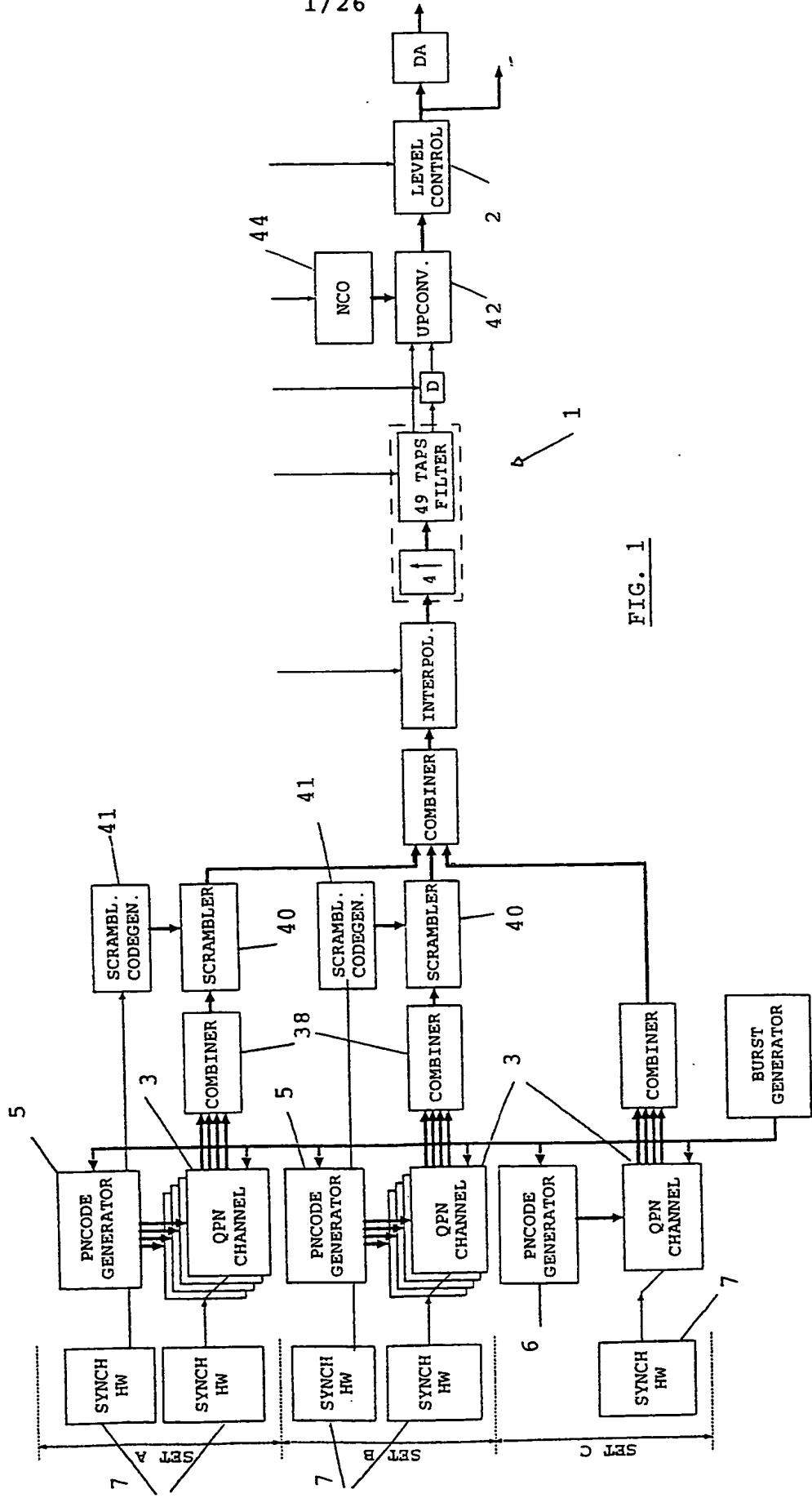
WO 01/08314 A2

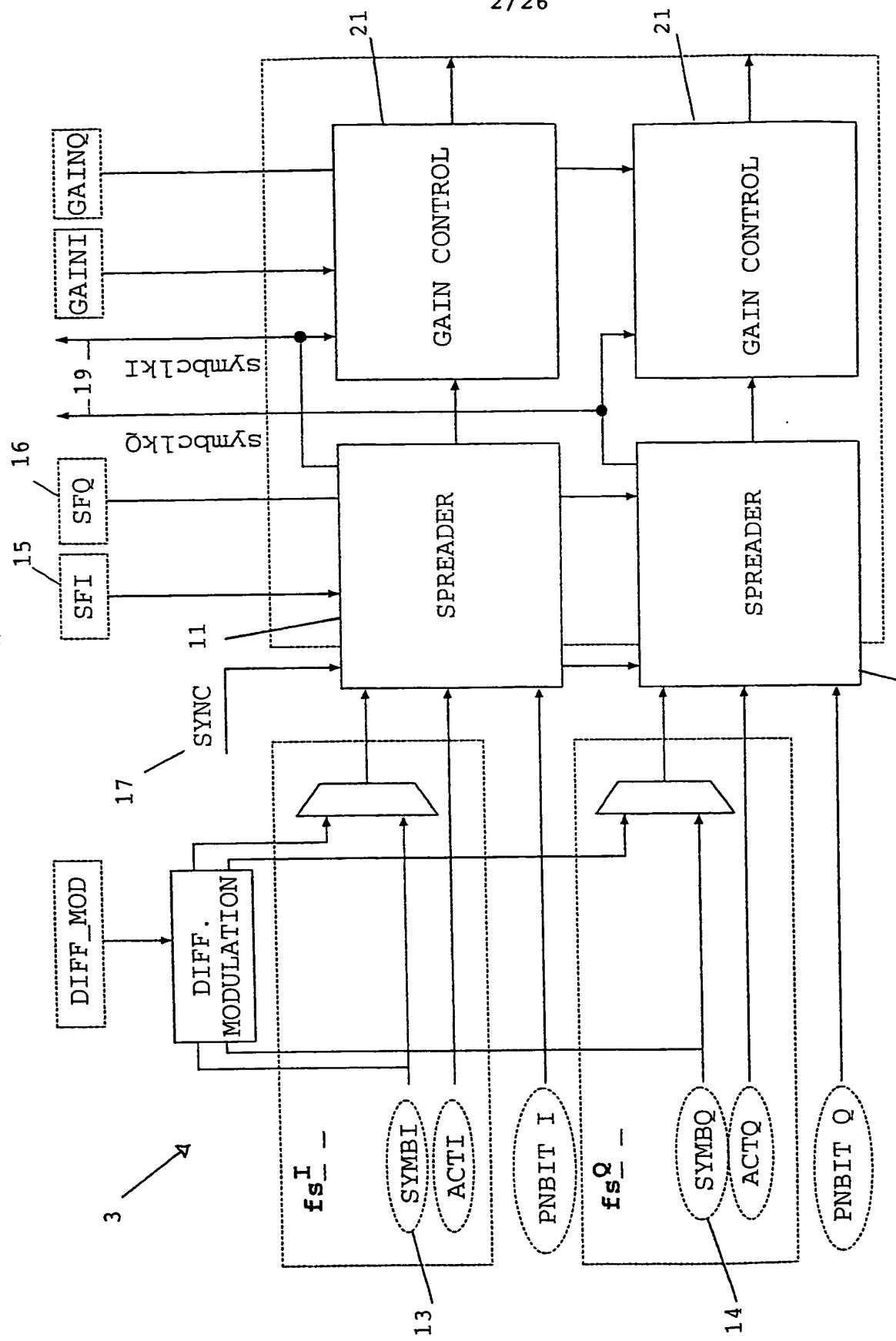
WO 01/08314 A2



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

1/26

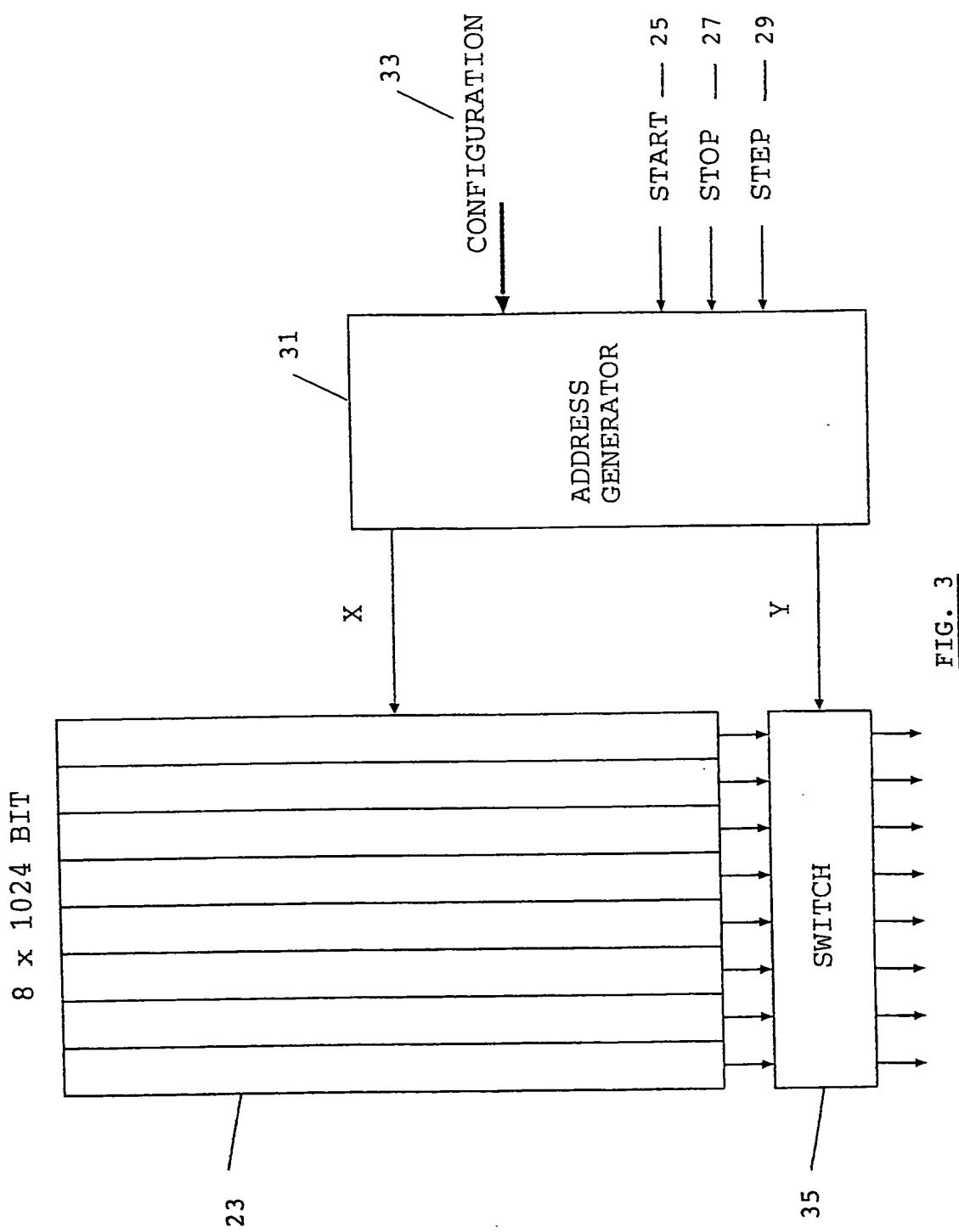




11

FIG. 2

3/26

FIG. 3

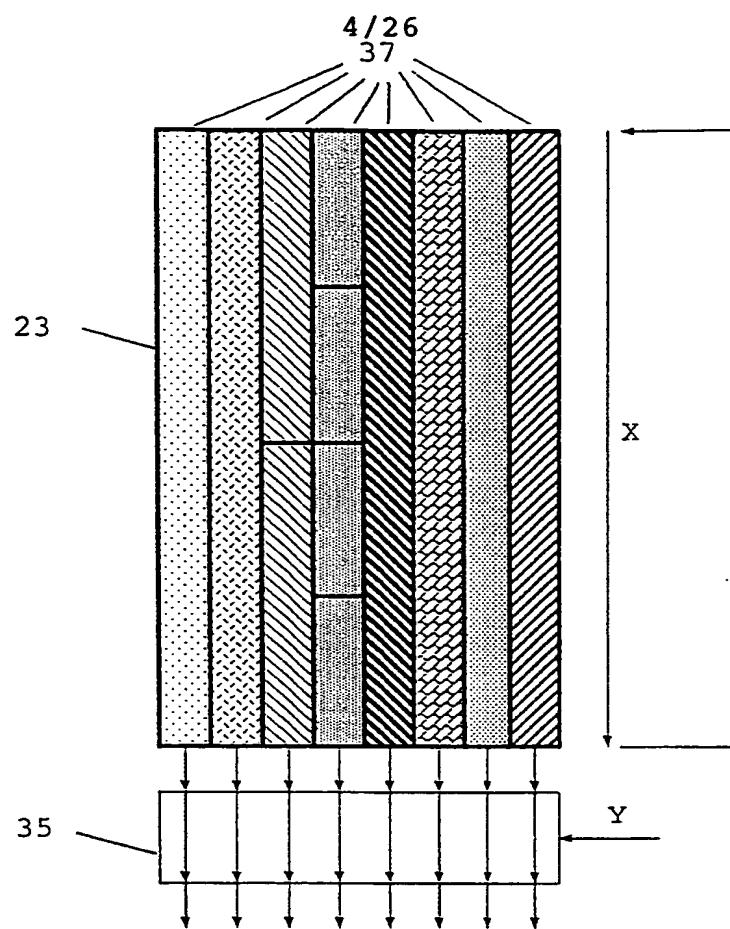


FIG. 4

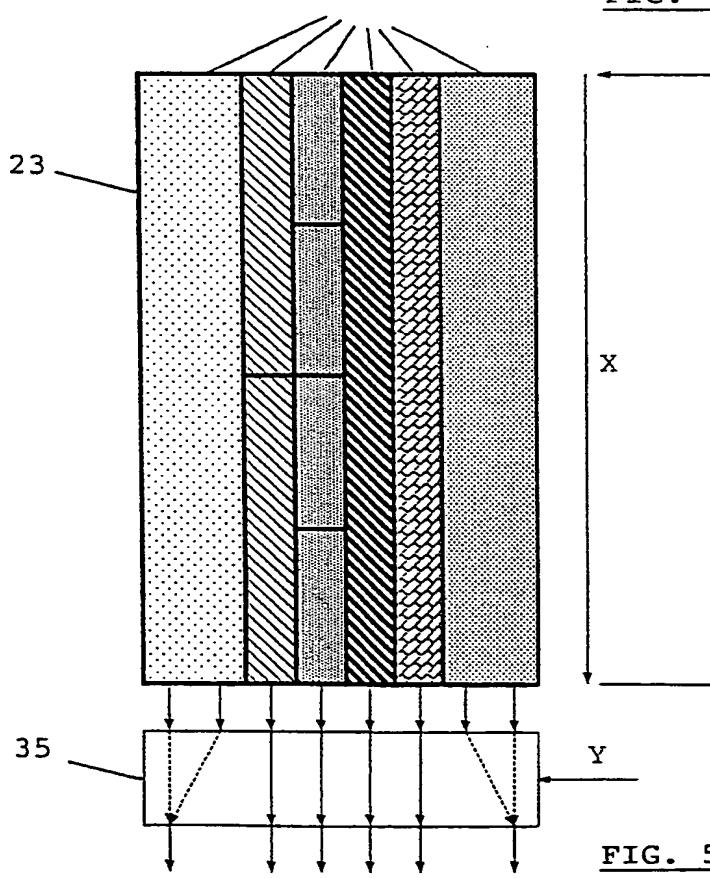


FIG. 5

5/26

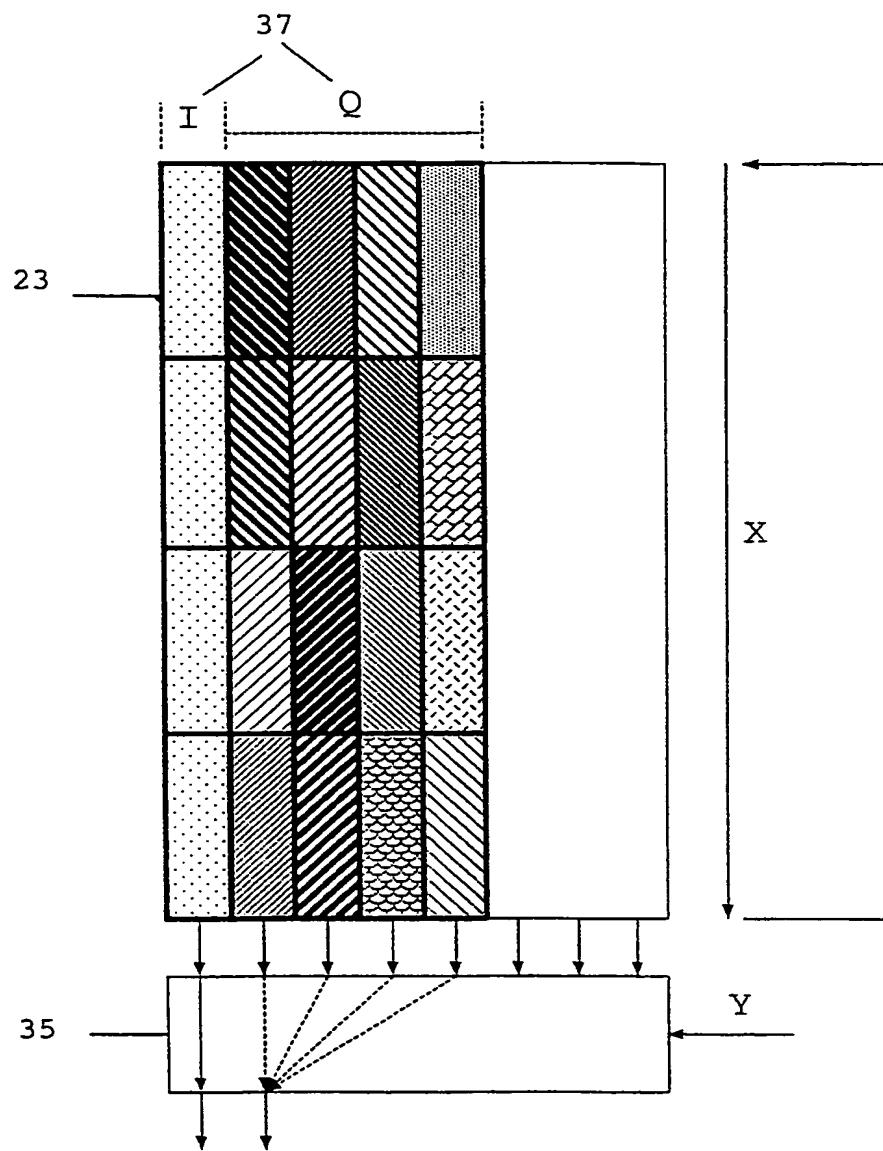


FIG. 6

6 / 26

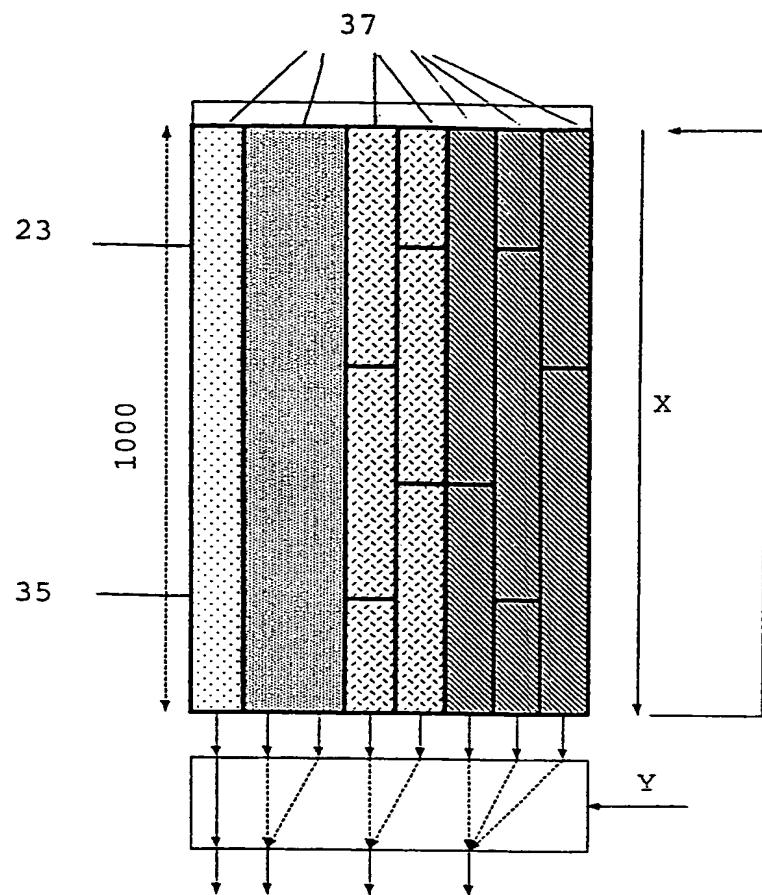


FIG. 7

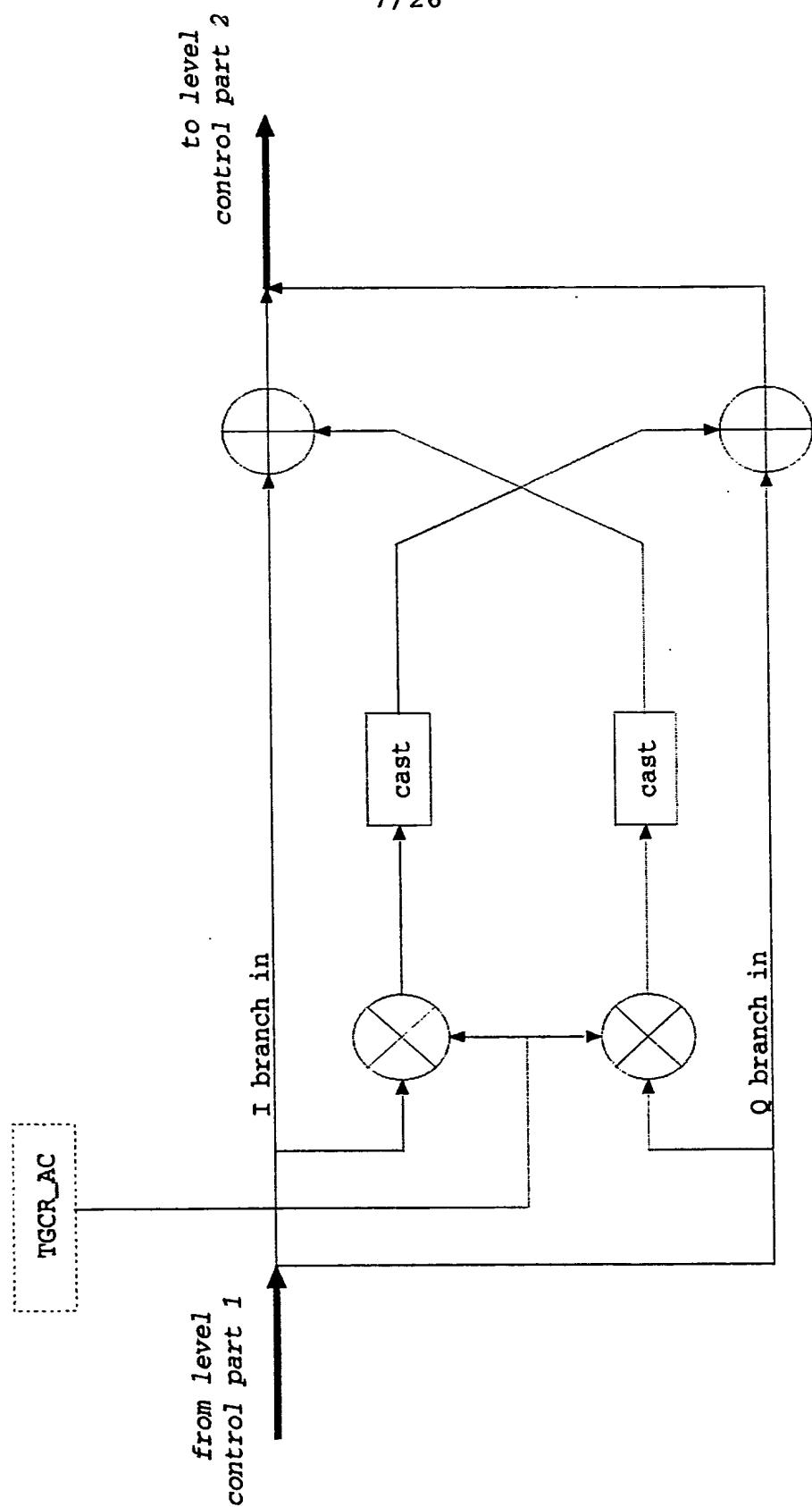


FIG. 8

8/26

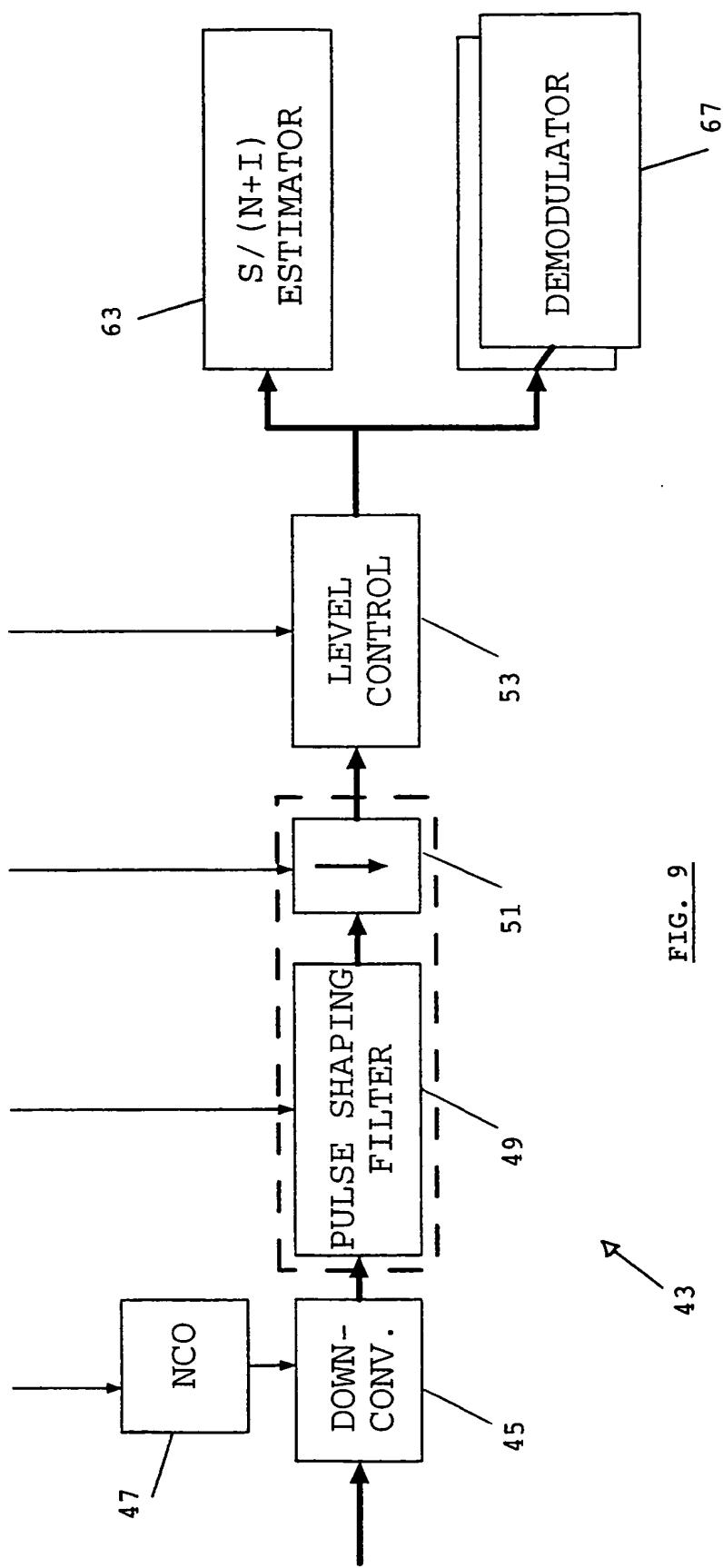


FIG. 9

9 / 26

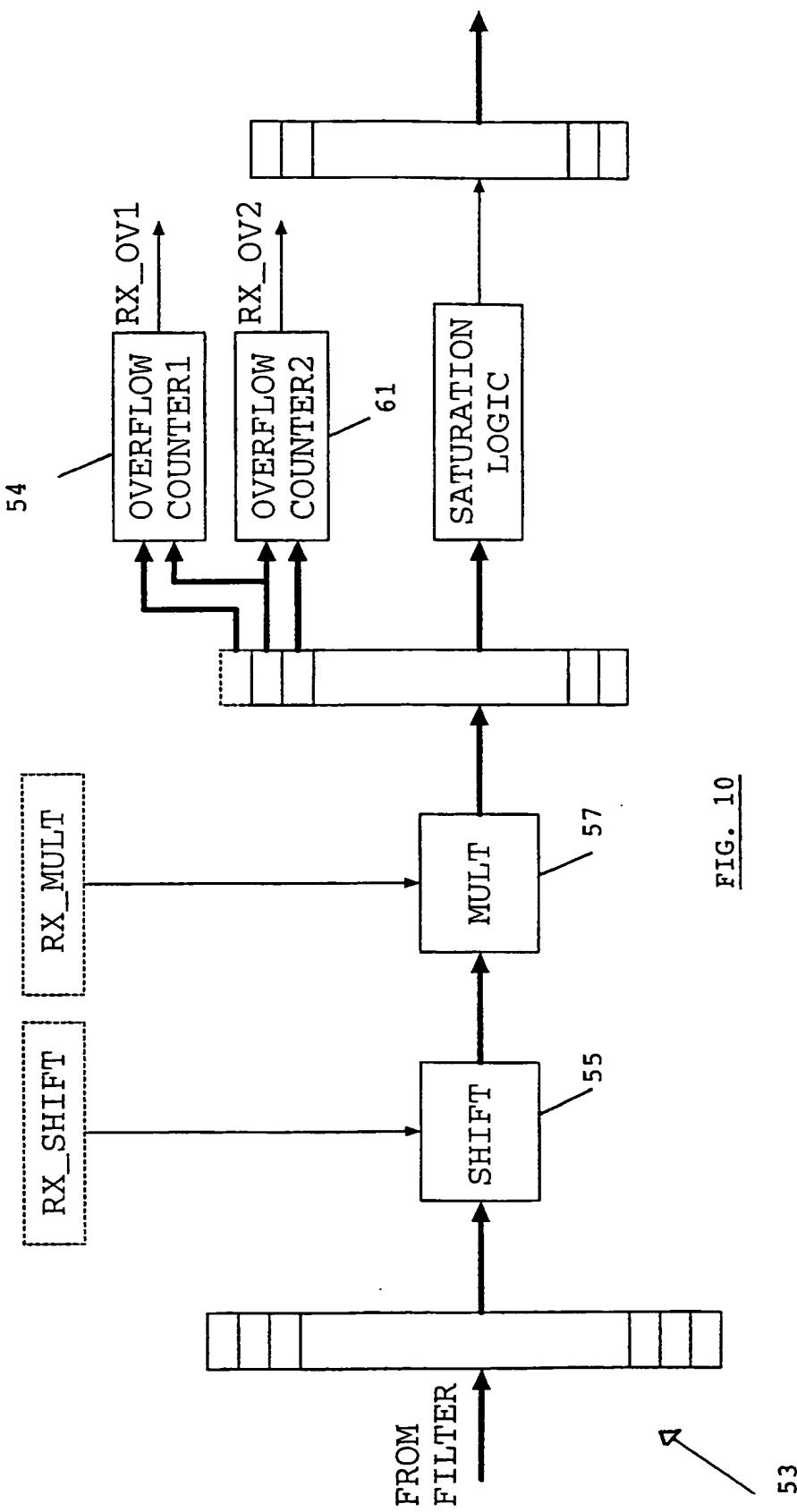


FIG. 10

10 / 26

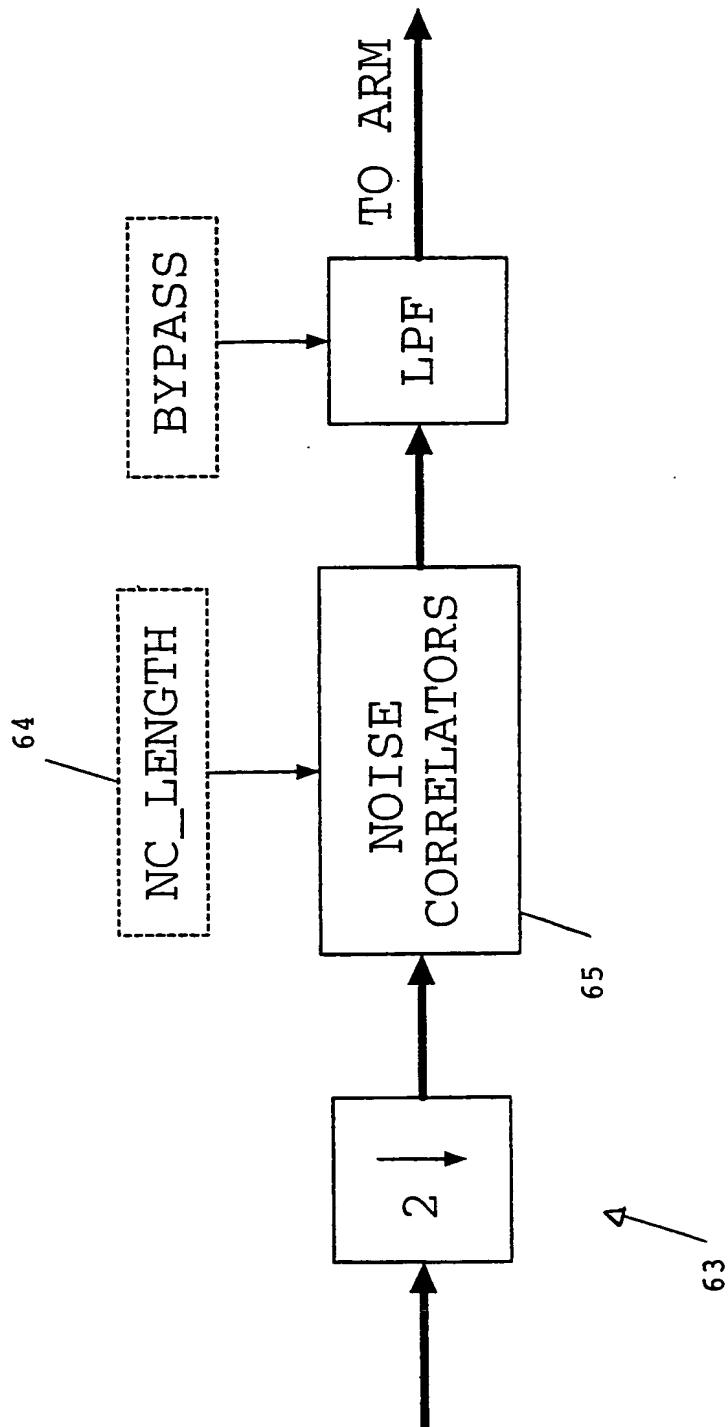
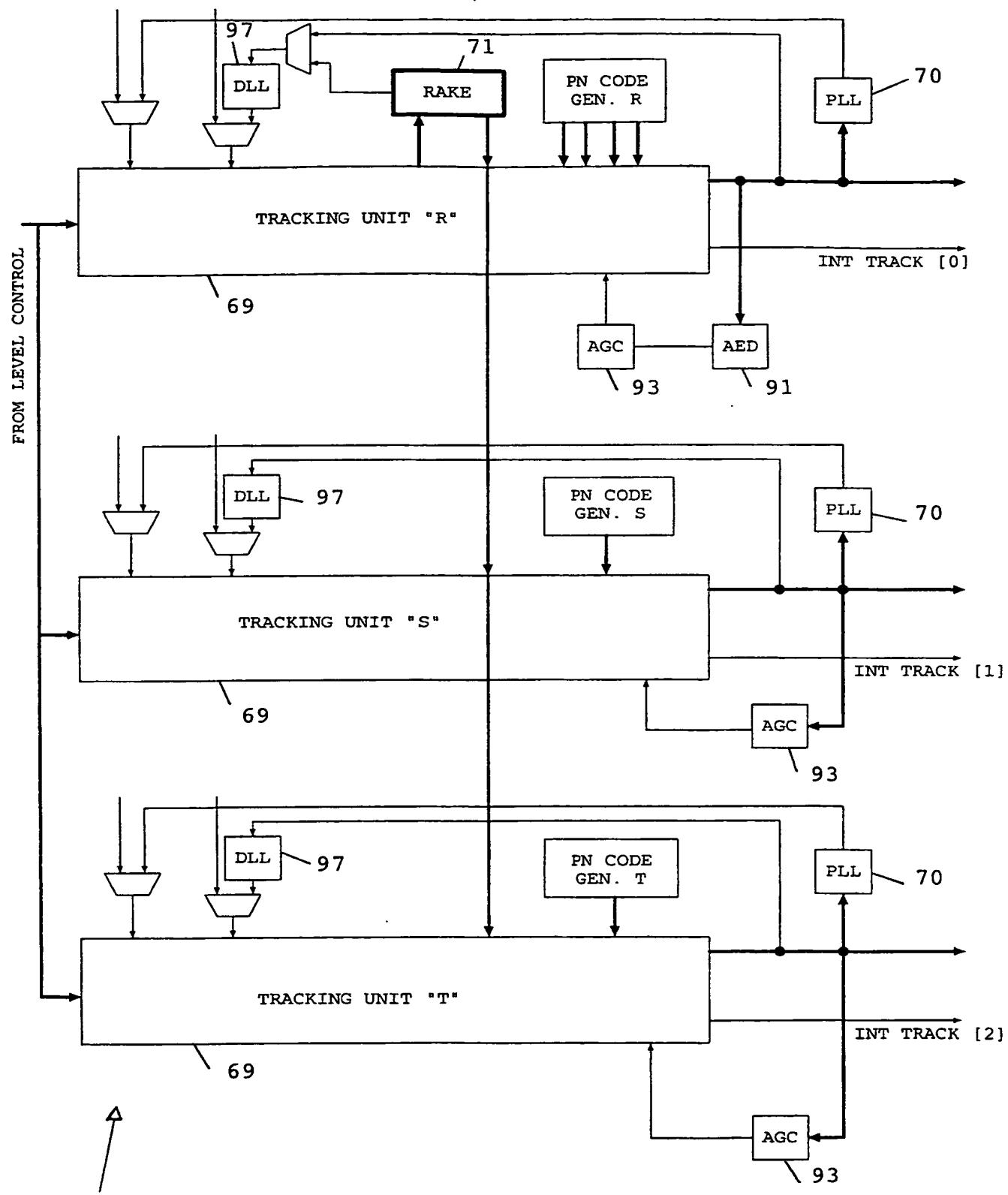


FIG. 11

11/26

FIG. 12

12/26

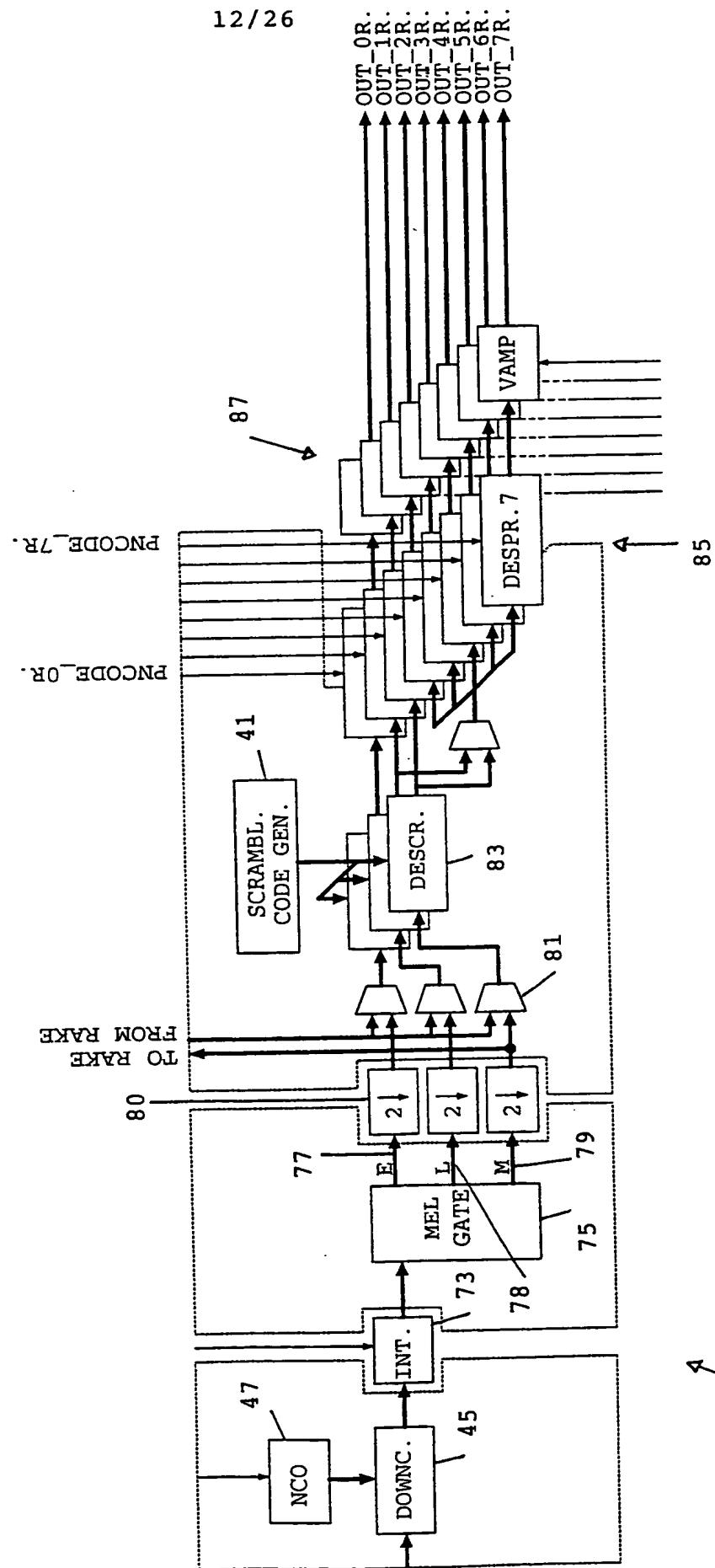
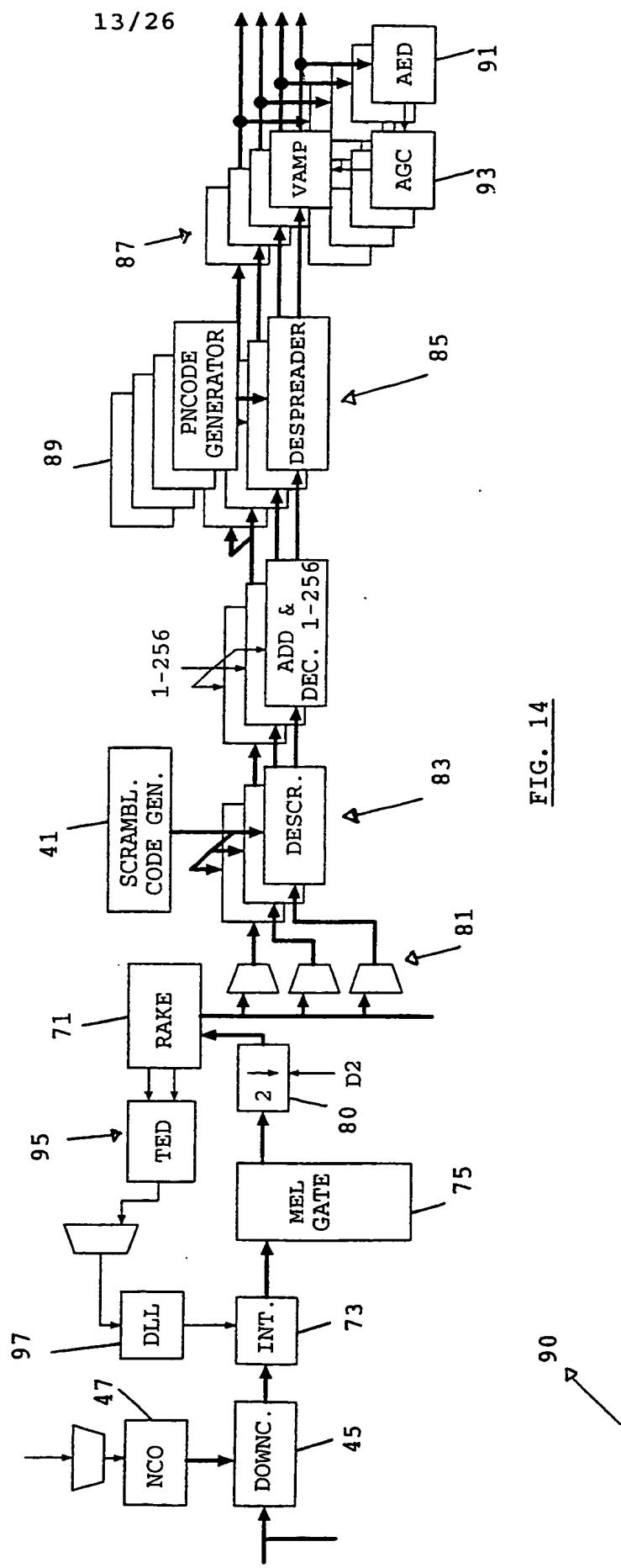


FIG. 13

FIG. 14

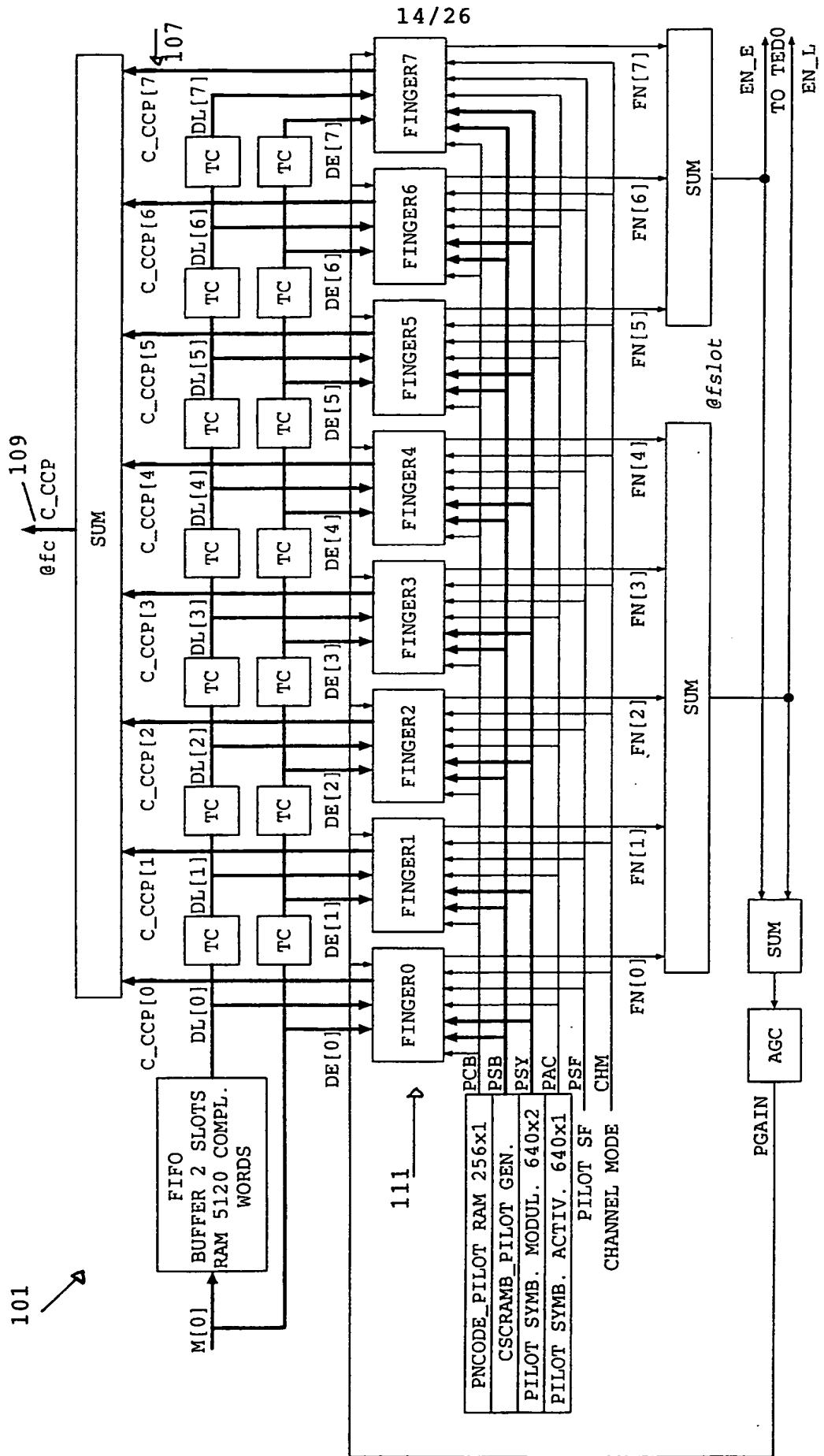
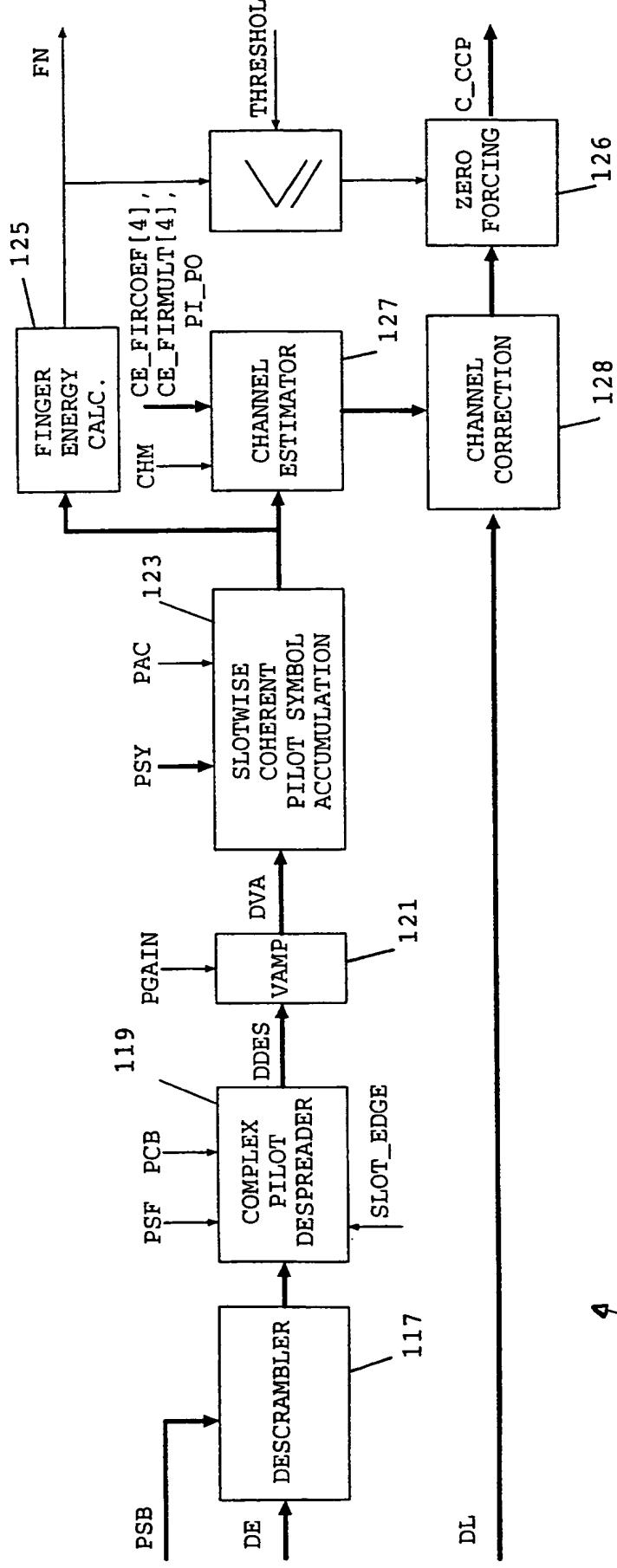
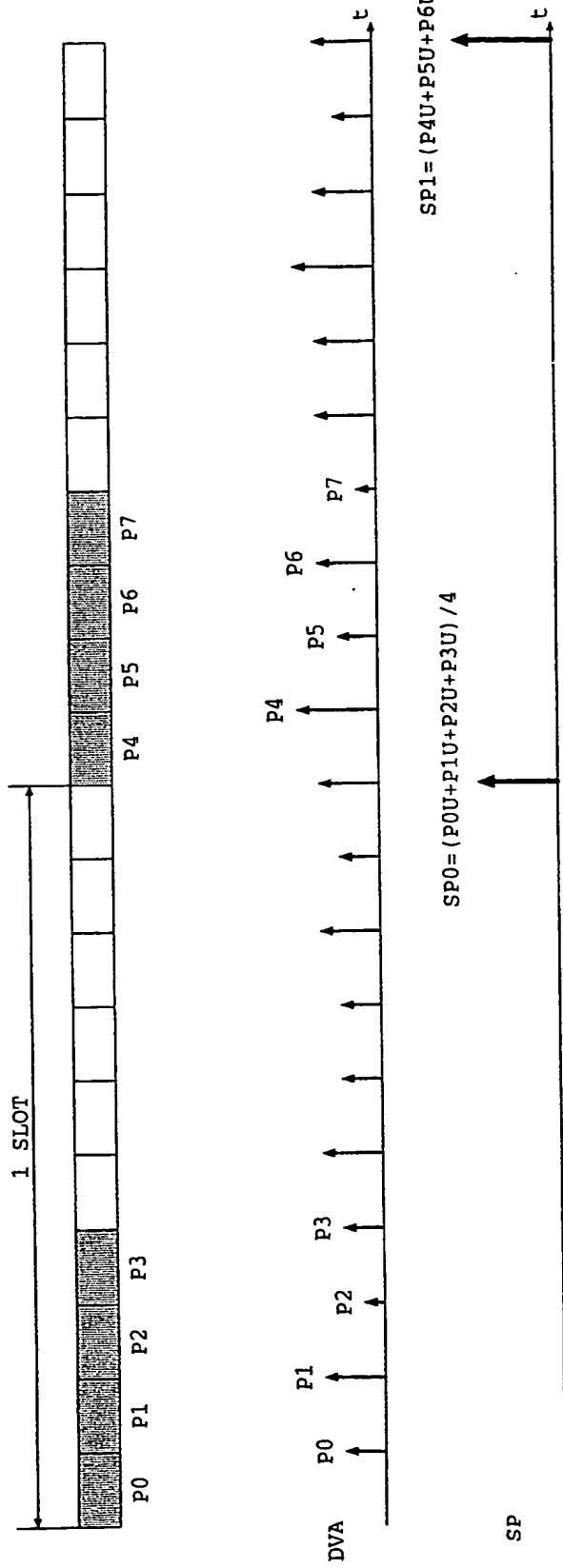


FIG. 15

15 / 26

FIG. 16

16 / 26

FIG. 17

17/26

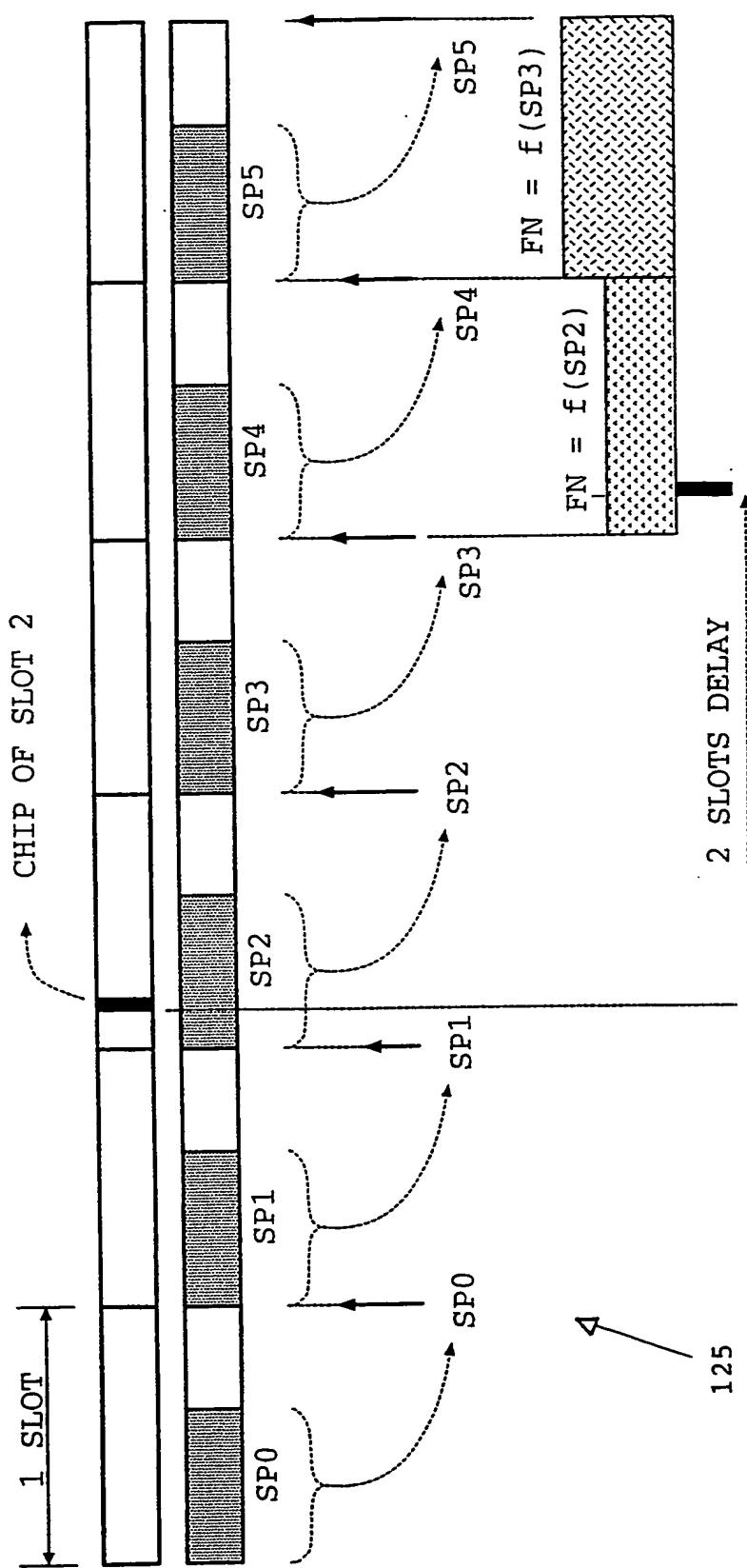


FIG. 18

18 / 26

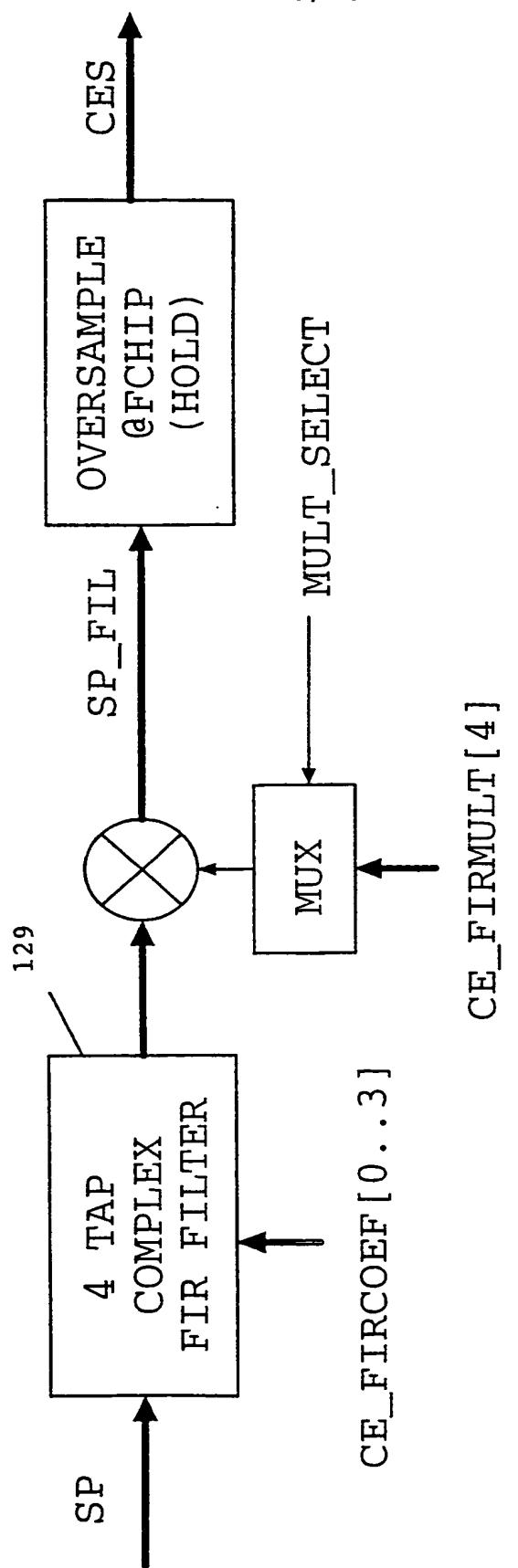
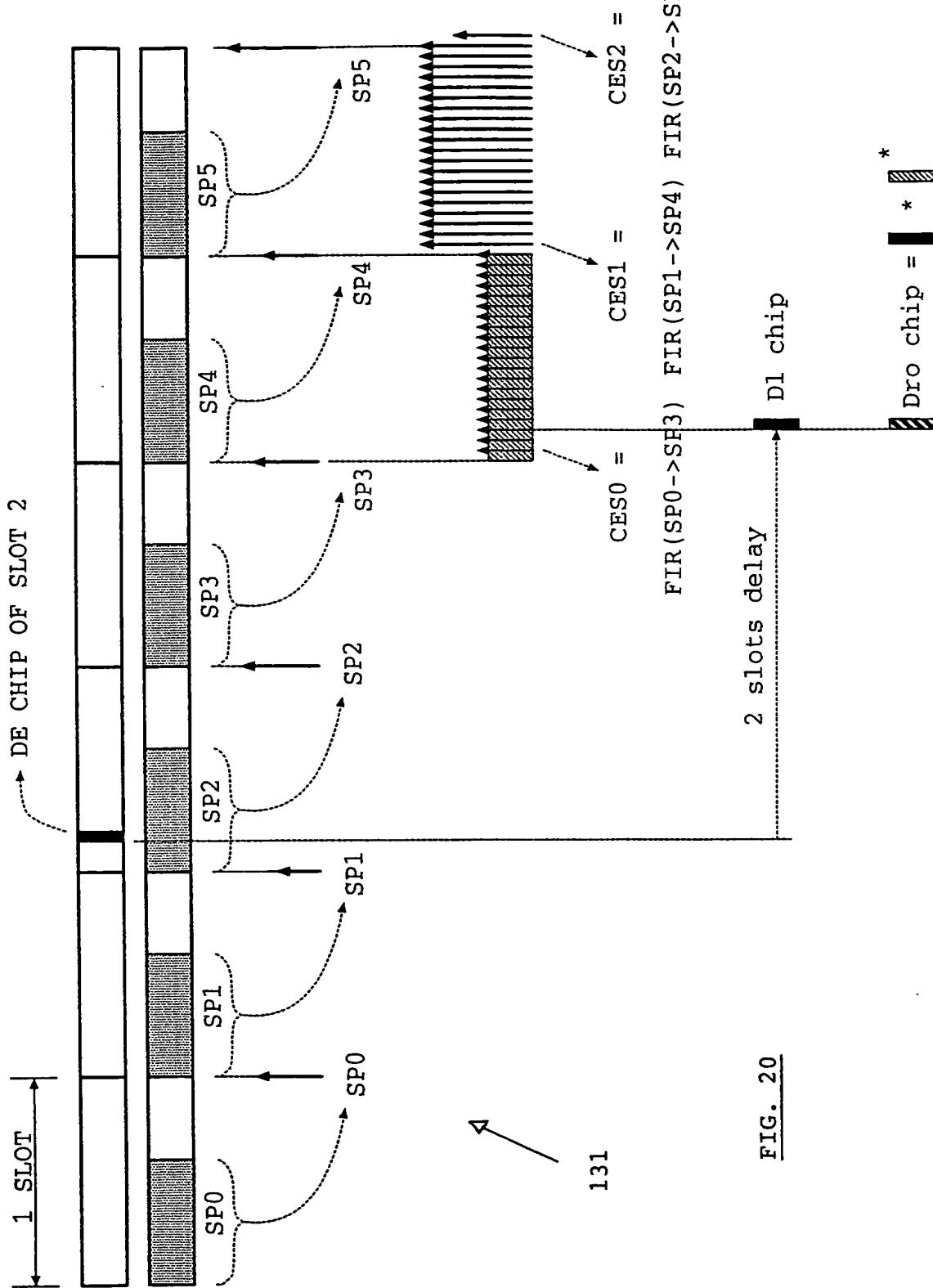


FIG. 19

19 / 26

FIG. 20

20/26

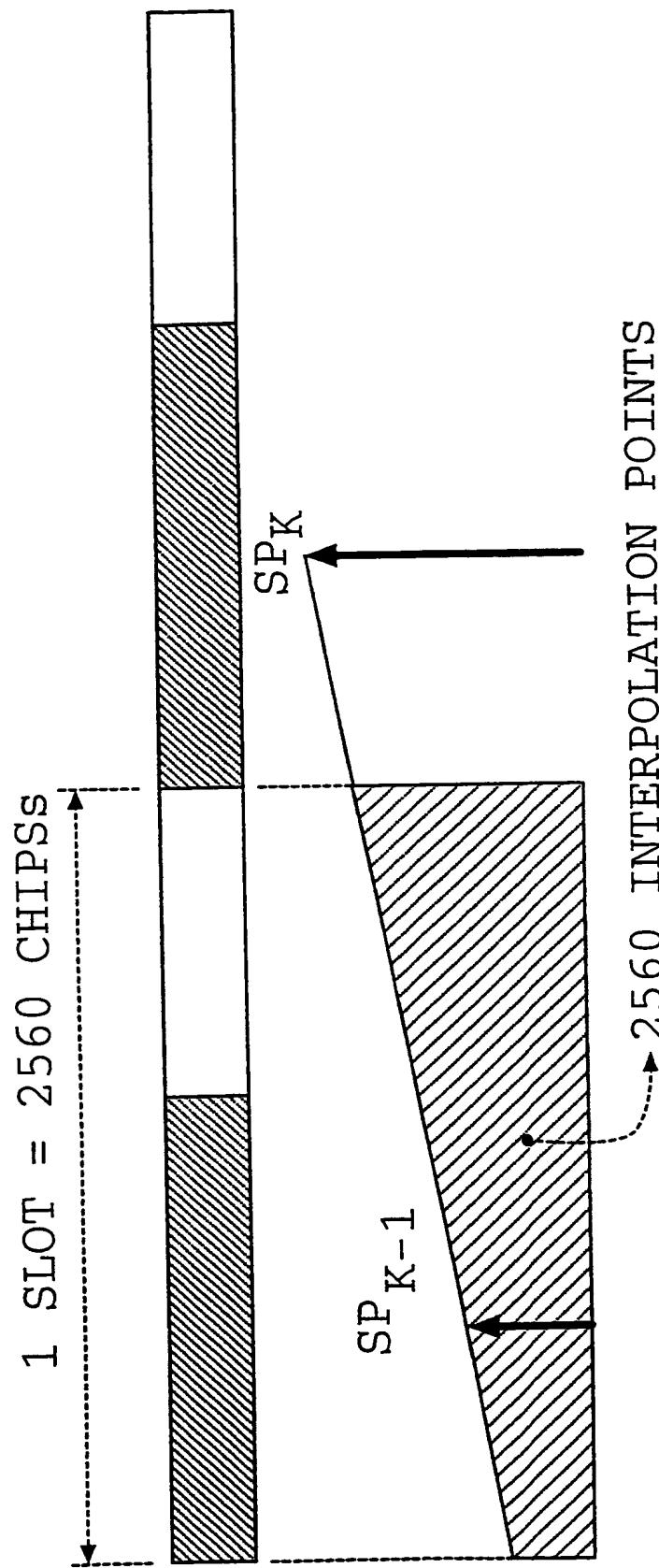
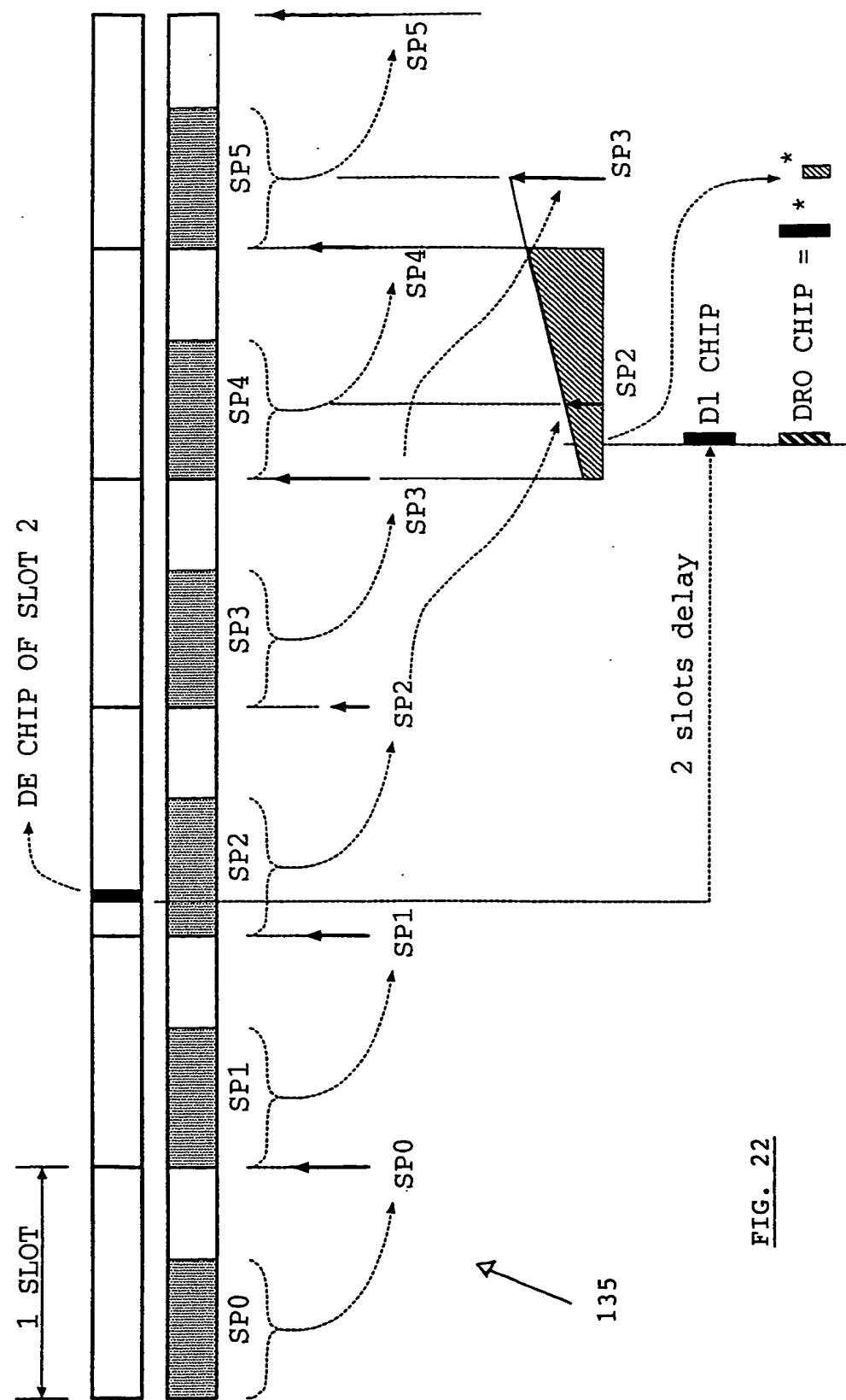


FIG. 21

21/26

FIG. 22

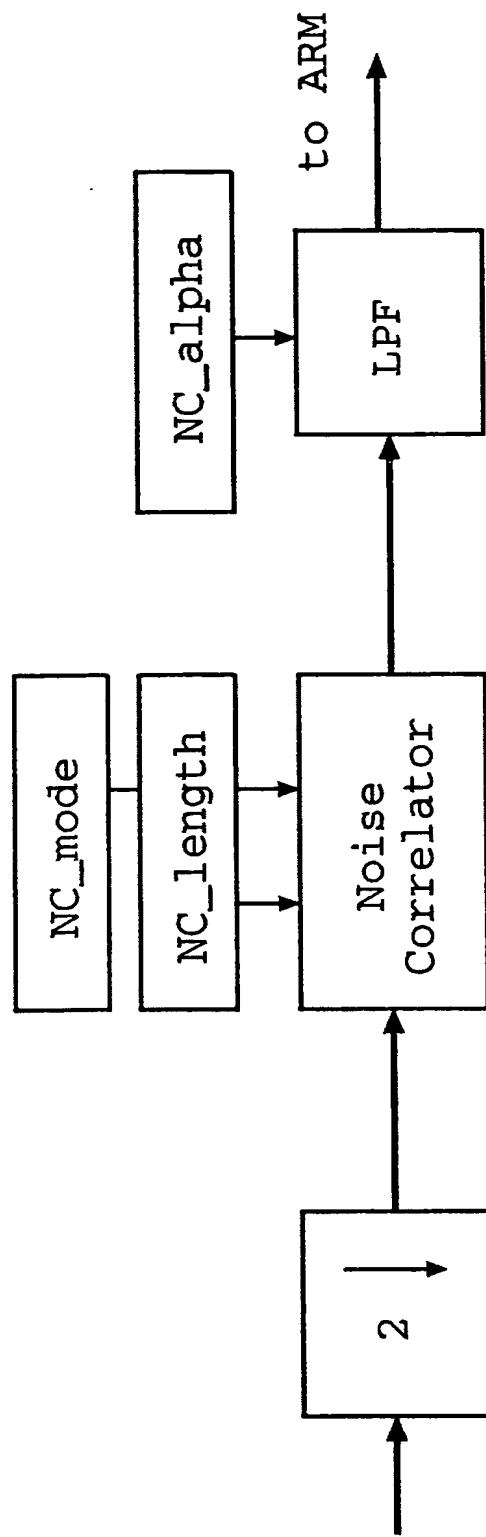


FIG. 23

23 / 26

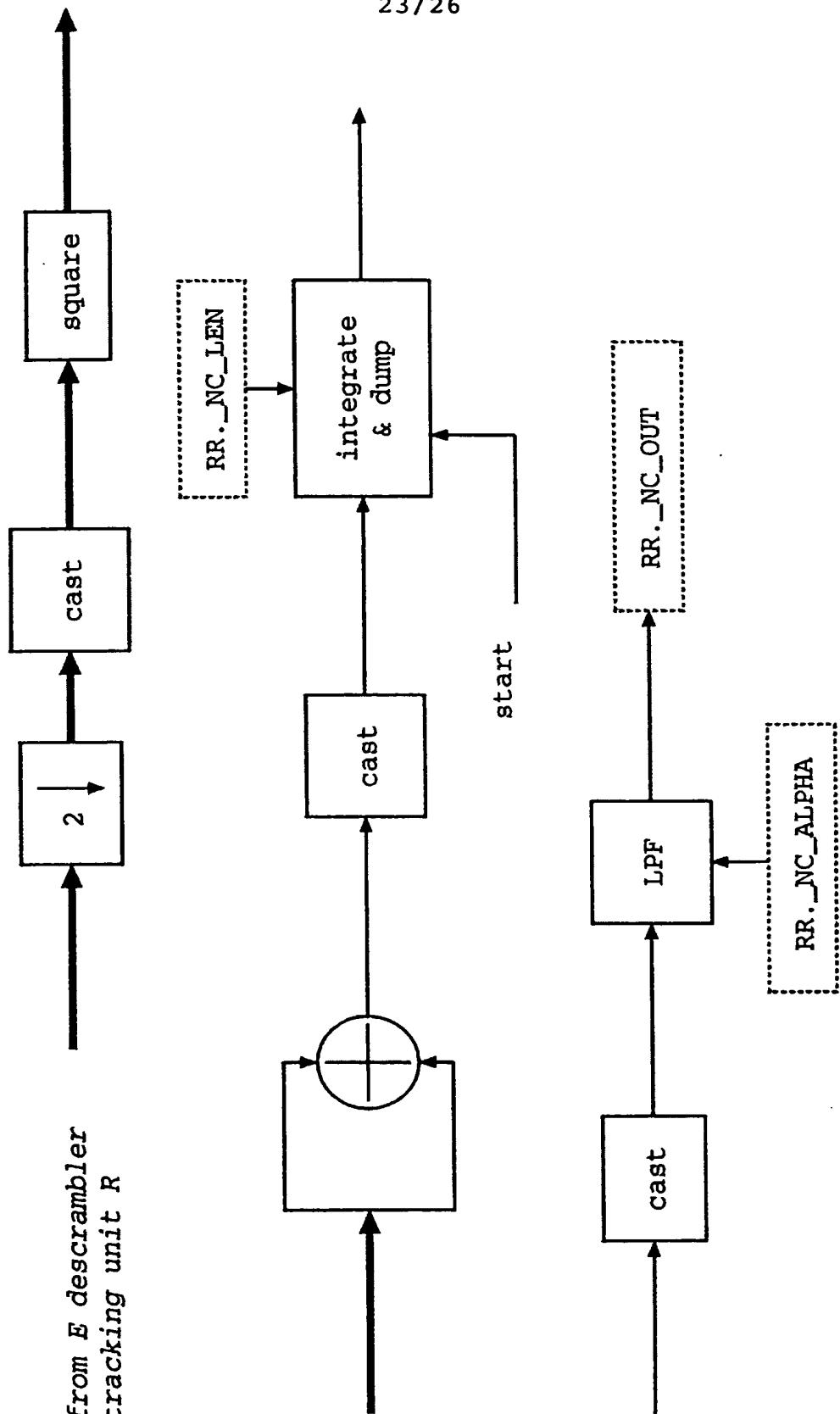
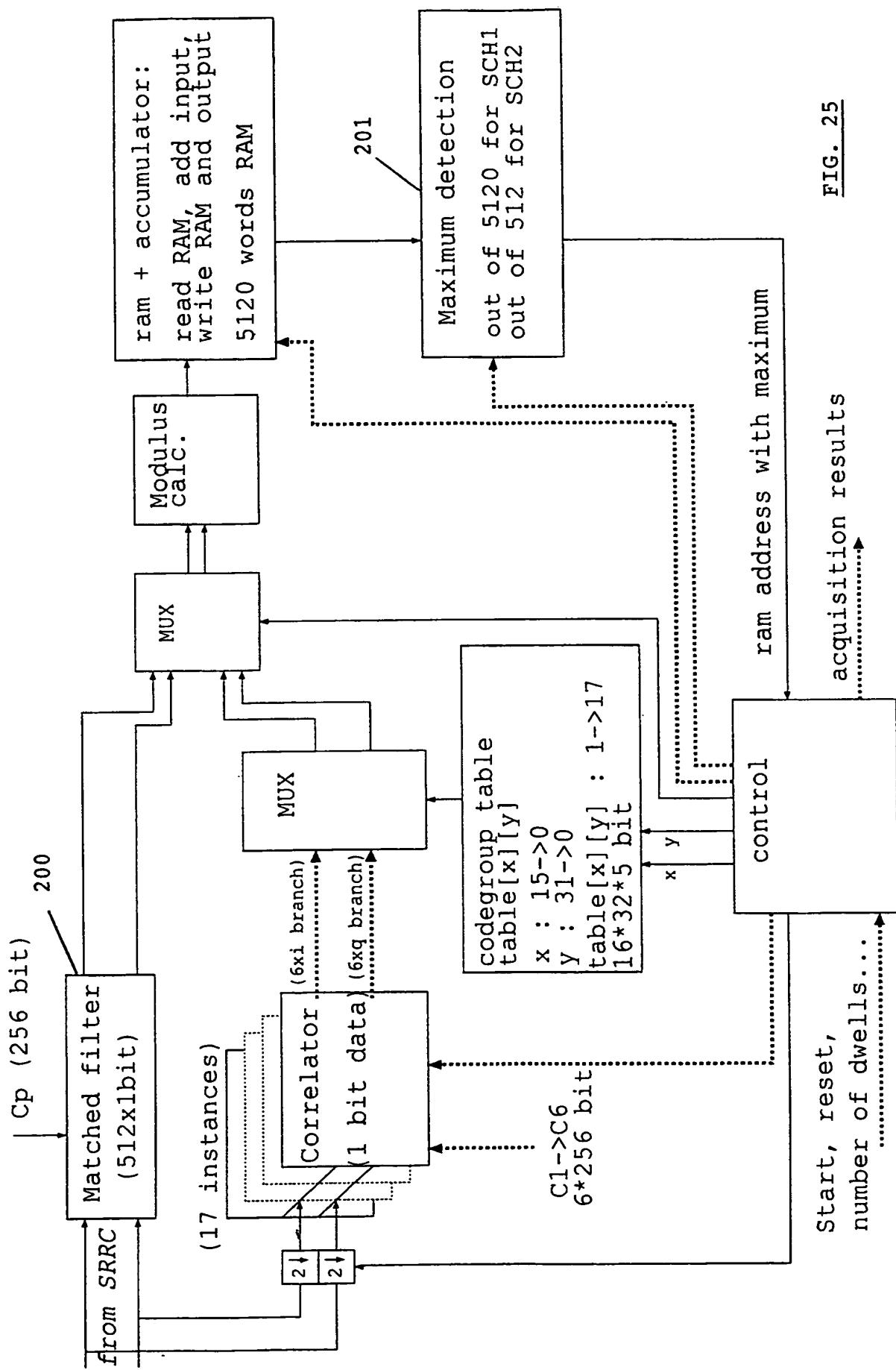


FIG. 24

FIG. 25

25 / 26

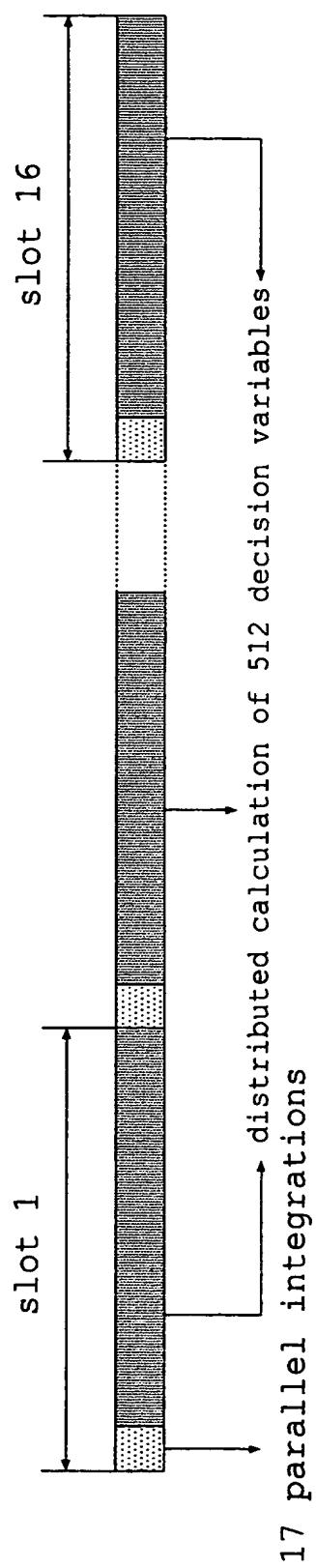
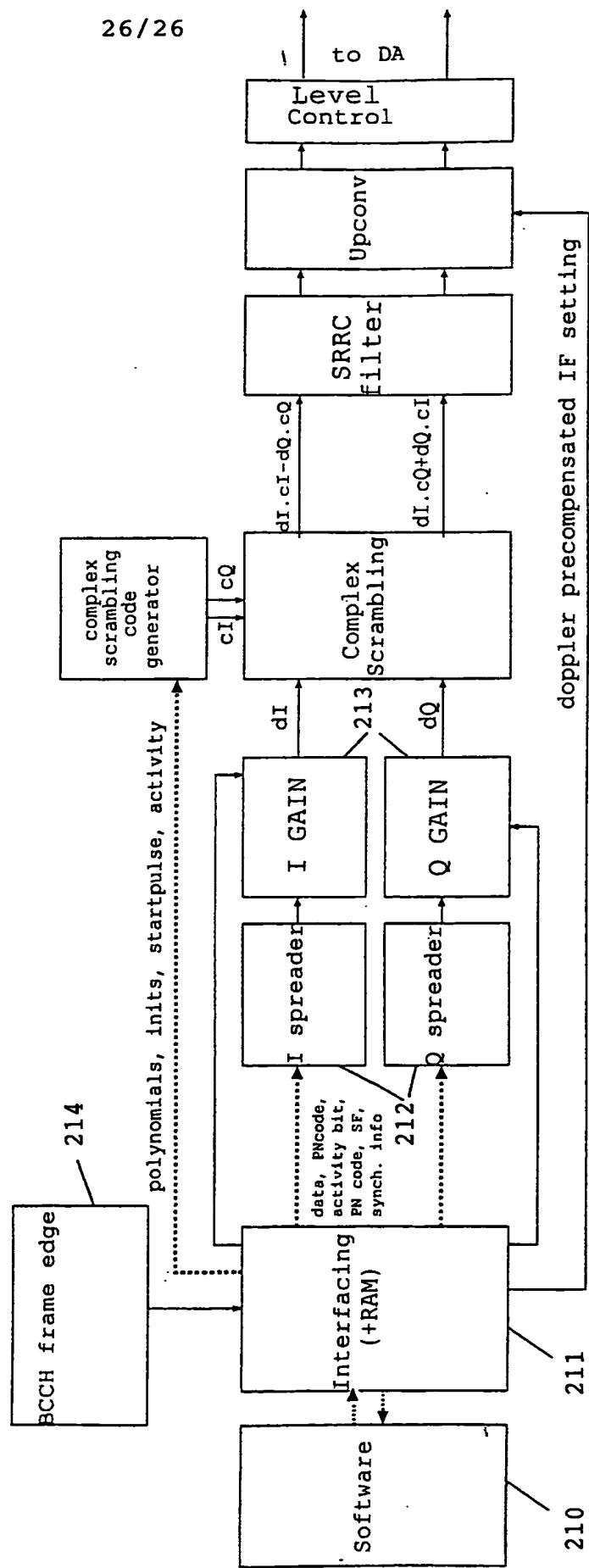


FIG. 26

26/26



(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number
WO 01/08314 A3(51) International Patent Classification⁷: H04B 1/707,
1/38, 7/005, 7/26, H04L 27/18, H04J 13/02

Jurgen [BE/BE]; Diestsestraat 250 B3, B-3000 Leuven (BE). VANHOOF, Jan [BE/BE]; Wijgmaalbroeck 59, B-3018 Wijgmaal (BE).

(21) International Application Number: PCT/BE00/00086

(74) Agents: VAN MALDEREN, Joëlle et al.; Office Van Malderen, Place Reine Fabiola, 6/1, B-1083 Brussels (BE).

(22) International Filing Date: 19 July 2000 (19.07.2000)

(25) Filing Language: English

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(26) Publication Language: English

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).(30) Priority Data:
60/145,426 23 July 1999 (23.07.1999) US

Published:

(71) Applicant (*for all designated States except US*): SIRIUS COMMUNICATIONS N.V. [BE/BE]; Wingpark 51, B-3110 Rotselaar (BE).

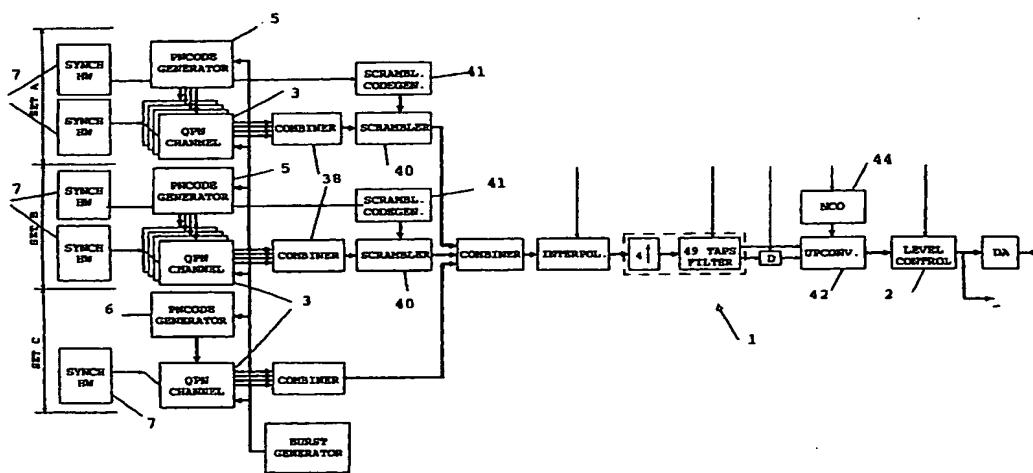
— With international search report.

(72) Inventors; and
(75) Inventors/Applicants (*for US only*): LUGIL, Nico [BE/BE]; Vrouwenparklaan 31, B-3110 Rotselaar (BE). BORGHS, Eric [BE/BE]; Kollegestraat 75, B-2440 Geel (BE). LOUVEAUX, Sébastien [BE/BE]; Avenue De L'Equerre 25 B302, B-1348 Louvain-La-Neuve (BE). MERTENS, Carl [BE/BE]; Het Venneke 2, B-2930 Brasschaat (BE). PHILIPS, Lieven [BE/BE]; Kleine Kruisweg 9A, B-3201 Aarschot (BE). VANDERMOT,

(88) Date of publication of the international search report: 31 May 2001

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR HIGH-SPEED SOFTWARE RECONFIGURABLE CODE DIVISION MULTIPLE ACCESS COMMUNICATION

**WO 01/08314 A3**

(57) Abstract: The present invention is related to a communication device for W-CDMA signal transmission and reception, comprising: a W-CDMA transmitter comprising RAM and/or registers, a W-CDMA receiver comprising RAM and/or registers and signal acquisition means, being software reconfigurable, characterized in that it further comprises at least a digital circuit for phase unbalance precompensation. The present invention further relates to a method for operating a W-CDMA communication device of the present invention, characterised in that it comprises the following steps: configuring said device for a specific use, and transmitting and/or receiving and/or acquiring waveform signals.

WO 01/08314 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Int'l. Appl. No.
 PCT/00/00086

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B1/707 H04B1/38 H04B7/005 H04B7/26 H04L27/18
H04J13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, INSPEC, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 767 544 A (IMEC INTER UNI MICRO ELECTR ;SAIT (BE)) 9 April 1997 (1997-04-09) cited in the application page 3, line 41 - line 45 page 4, line 35 -page 6, line 23 page 10, line 41 -page 15, line 55 page 30, line 53 -page 31, line 10 — US 5 742 637 A (KANTERAKIS EMMANUEL ET AL) 21 April 1998 (1998-04-21) column 3, line 18 - line 34 column 6, line 48 -column 7, line 20 — —/—	1, 4, 6-9, 12-15, 18-22, 31-39
A	US 5 742 637 A (KANTERAKIS EMMANUEL ET AL) 21 April 1998 (1998-04-21) column 3, line 18 - line 34 column 6, line 48 -column 7, line 20 — —/—	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

3 November 2000

Date of mailing of the international search report

02 03. 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
 Fax: (+31-70) 340-3016

Authorized officer

GERLING J.C.J.

INTERNATIONAL SEARCH REPORT

Int. dional Application No
PCT/B/00086

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>"Sirius Announces World's First Software Configurable W-CDMA Core for Third-Generation Wireless handsets and Base Stations"</p> <p>SIRIUS COMMUNICATIONS PRESS RELEASES, 'Online! 14 June 1999 (1999-06-14), pages 1-2, XP002151828 BRUSSELS (BE)</p> <p>Retrieved from the Internet: <URL:HTTP://WWW.SIRIUSCOMM.COM/PRESSREALEA SES/PRESSCDMAX.HTM> 'retrieved on 2000-10-25! the whole document</p> <p>-----</p> <p>EP 0 928 084 A (MITSUBISHI ELECTRIC CORP) 7 July 1999 (1999-07-07)</p> <p>-----</p>	1,4-22, 34-39
A		

INTERNATIONAL SEARCH REPORTInternational application No.
BE 00/00086**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1, 4-22, 31-39

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1,4-22,31-39

2. Claim : 2

3. Claim : 3

4. Claims: 20-24

5. Claims: 20+25-30

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/BE 00086

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP 0767544 A	09-04-1997	US 5872810 A		16-02-1999
		EP 0772140 A		07-05-1997
		EP 1065611 A		03-01-2001
		US 5870588 A		09-02-1999
US 5742637 A	21-04-1998	US 6021157 A		01-02-2000
EP 0928084 A	07-07-1999	EP 1071235 A		24-01-2001
		EP 1071236 A		24-01-2001
		EP 1071237 A		24-01-2001
		EP 1071238 A		24-01-2001
		JP 11284688 A		15-10-1999
		JP 2001007883 A		12-01-2001
		JP 2001007888 A		12-01-2001
		JP 2001007881 A		12-01-2001